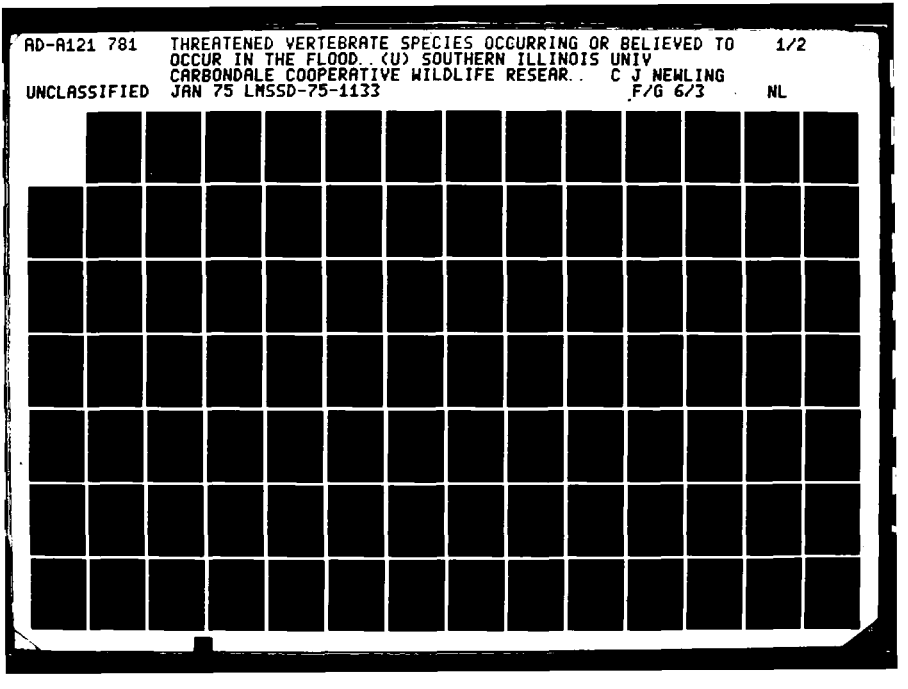
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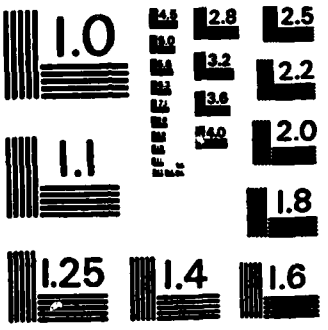

Threatened Vertebrate Species Occurring or Believed to Occur in the Floodplains of the Mississippi River between Cairo, Illinois, and Minneapolis, Minnesota, and of the Illinois Waterway between Grafton, Illinois, and Chicago, Illinois

by

Charles J. Newling

January 1975

Prepared for U.S. Army Engineer District, St. Louis,
Corps of Engineers, St. Louis, Missouri

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

The following report summarizes the results of a literature survey of the existing knowledge on threatened vertebrates which are known to occur or are likely to occur in the floodplains of the Mississippi River between Cairo, Illinois, and Minneapolis, Minnesota, and of the Illinois Waterway between Grafton, Illinois, and Chicago, Illinois. Definitions of various threatened classifications are explained. Species occurring are listed individually with data pertaining to their distribution and ecological requirements. A total of 143 species are discussed including 38 fish, 34 amphibians and reptiles, 49

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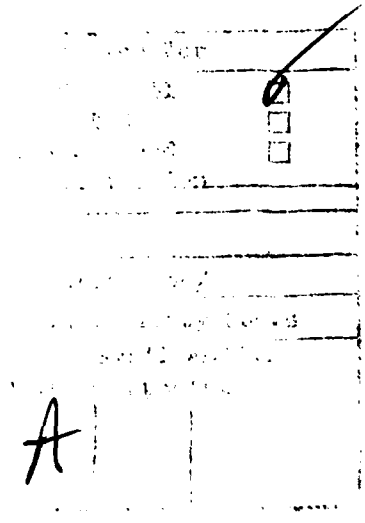
birds, and 22 mammals. All threatend vertebrates listed for the adjoining states are included in the Appendix regardless of their occurrence in the study area.

SUMMARY

The following report summarizes the results of a literature survey of the existing knowledge on threatened vertebrates which are known to occur or are likely to occur in the floodplains of the Mississippi River between Cairo, Illinois, and Minneapolis, Minnesota, and of the Illinois Waterway between Grafton, Illinois, and Chicago, Illinois. Definitions of various threatened classifications are explained. Species occurring are listed individually with data pertaining to their distribution and ecological requirements. A total of 143 species are discussed including 38 fish, 34 amphibians and reptiles, 49 birds, and 22 mammals. All threatened vertebrates listed for the adjoining states are included in the Appendix regardless of their occurrence in the study area.



PREFACE

This report was prepared under Purchase Order No. LMSSD 75-1133, dated 6 November 1974, between the U.S. Army Engineer District, St. Louis, and Charles J. Newling. Research for and preparation of this report took place at several locations, primarily at the Cooperative Wildlife Research Laboratory, Southern Illinois University at Carbondale, and Morris Library, Southern Illinois University at Carbondale. Charles J. Newling was the zoologist. Mr. John Brady, biologist, monitored the project for the U.S. Army Engineer District, St. Louis.

ACKNOWLEDGEMENTS

Sincere appreciation is extended to Dr. W. D. Klimstra, Director, and Mrs. Virginia A. Terpening of the Cooperative Wildlife Research Laboratory, Southern Illinois University at Carbondale, for their generous assistance to the author and for access to their research facilities. The author also thanks Dr. R. C. Heidinger, Dr. R. H. Mohlenbrock, Dr. P. W. Smith, Ruth L. Hine, E. F. Miller, M. J. Sweet, J. R. Nawrot, and others who aided him with suggestions, criticisms, or materials.

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INTRODUCTION

Interest in the phenomenon of vanishing animals has grown considerably in the last decade. Spurred by public concern, the federal and some state governments have responded by initiating programs to identify and protect species of animals and plants threatened with extinction.

The purpose of this report is to identify the threatened vertebrate species occurring or believed to occur in the floodplains of the Mississippi River from Cairo, Illinois, to Minneapolis, Minnesota, and of the Illinois Waterway from Grafton, Illinois, to Chicago, Illinois. Henceforth, this region is referred to as "the study area" (Fig. 1).

This report is arranged in handbook form and provides for each species considered the designated status of the species, distribution of the species generally and within the study area, and some facts on species' ecology and habitat requirements. For completeness, a listing of all threatened vertebrates in the five state region encompassing the study area regardless of their occurrence is included as Appendix A.

The threatened vertebrates listed in this report were determined from a variety of sources. "Threatened Wildlife of the United

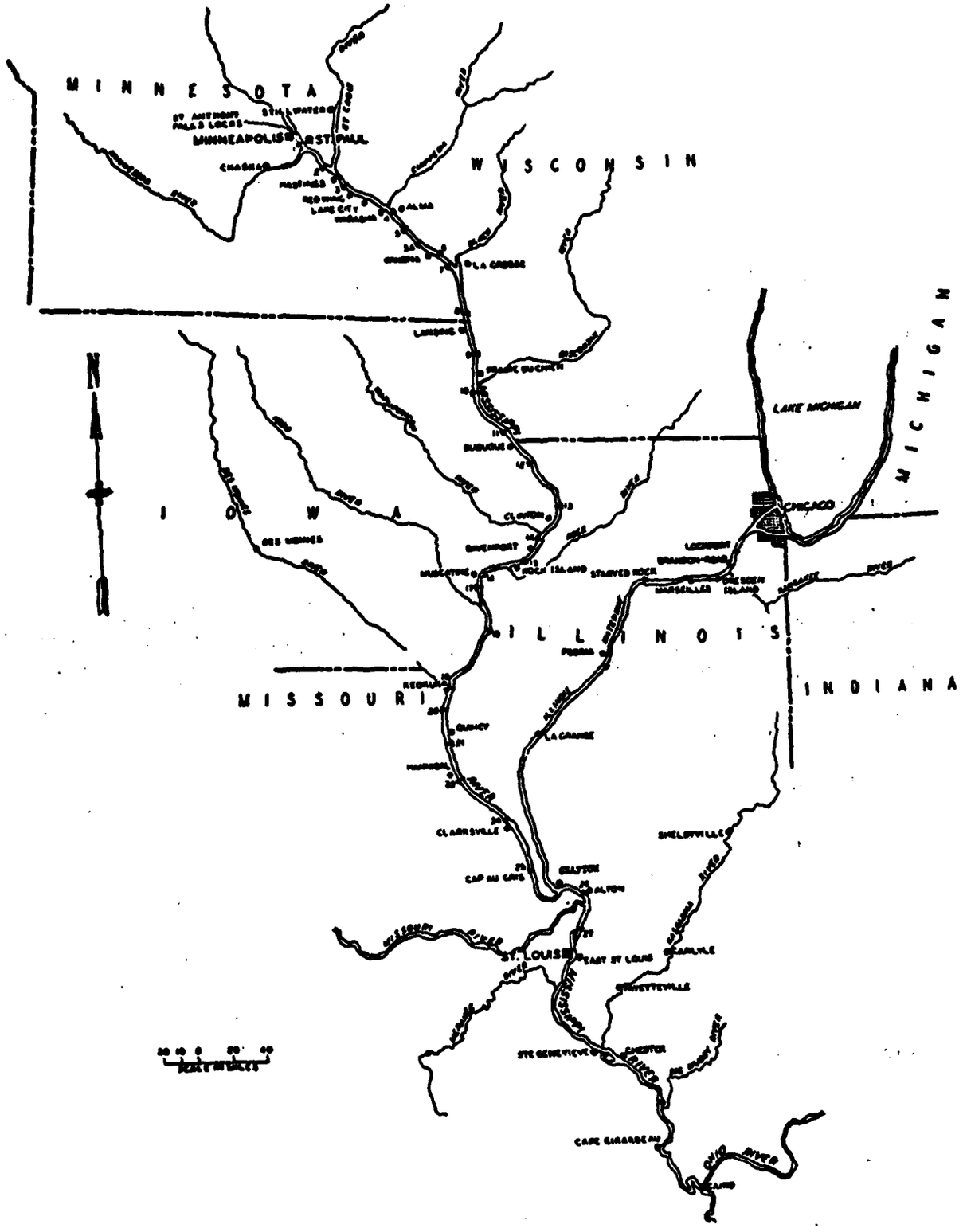

Fig. 1. The study area: the Mississippi River and its floodplain from Cairo, Illinois to Minneapolis, Minnesota, and the Illinois Waterway and its floodplain from Grafton, Illinois, to Chicago, Illinois.

States," 1973 edition, compiled by the Office of Endangered Species and International Activities, (OESIA), Bureau of Sport Fisheries and Wildlife, U.S. Department of the Interior, was the source for the listing of threatened and officially "endangered" species and subspecies on a national level. The states of Missouri (Holt et al. 1974) and Wisconsin (Hine et al. 1973) have "official" listings developed under authorization of their own state legislatures. Two listings of rare and endangered vertebrates are available for Illinois although they were not created by legislative mandate (Illinois Nature Preserves Commission, 1971, Lopinot and Smith 1973). No "official" list of rare and endangered species is available for Minnesota although the Minnesota Department of Natural Resources is developing a list at this time (personal communication, Bill Longley, Minnesota Department of Natural Resources). Iowa has no official listing of rare or endangered vertebrates presently.

Miller (1973) compiled an inventory of the threatened freshwater fish species in the United States including listings for Iowa and Minnesota. These were utilized in the Fish section of the report.

In some cases, a problem encountered was that species were given differing classifications by states on opposite sides of the Mississippi River. These classifications are intended to reflect status on a statewide basis rather than in localized regions such as the study area. To avoid confusion in this report, all of the individual classifications, federal and for state, are given for each of

the species considered.

Definitions of Classifications

The definitions for the terms used by the various nominating agencies are discussed below.

United States. Authorization for development of an official United States government list of endangered species was originally the Endangered Species Protection Act of 1966 and later its amended version, the Endangered Species Conservation Act of 1969. Under federal criteria, the given categories are defined as follows (OESIA, 1973):

> "Endangered": A species or subspecies that is determined by the Secretary of the Interior (after seeking the council of specialists and agencies with expertise on the subject) to be threatened with extinction and is placed on the "Federal Register" by the Secretary.
>
> "Threatened": A species or subspecies that appears in peril of extinction but is not presently included on the "Federal Register."
>
> "Status Undetermined": A species or subspecies that has been suggested as possibly threatened with extinction, but about which there is not enough information to determine its status.

Illinois. The Illinois Nature Preserves Commission (INPC, 1971) used three classifications in describing threatened vertebrates in Illinois.

> "Rare": Indicates very restricted range and/or numbers in Illinois. Many of the species included here are animals whose natural ranges just reach Illinois. They may be abundant just beyond Illinois borders but are rare within the state. In the case of birds, they may be abundant as migrants but are placed on the list because they are rare as breeding populations.

"Endangered": Means in danger of extirpation from Illinois. It applies both to breeding populations and to migratory species that regularly migrate through or winter within Illinois.

"Possibly Already Extirpated": Probable or possible extirpation from Illinois in indicated.

Lopinot and Smith (1973:1-2) used only two categories in their "Rare and Endangered Fish of Illinois."

"Rare": Indicates not under immediate threat of extinction in Illinois but occurring in such small numbers and/or in such restricted habitat that it could quickly disappear.

"Endangered": Indicates a species is actively threatened with extinction in the state. Continued survival is unlikely without special protective measures.

Species already extirpated from Illinois were not considered.

Missouri. Holt et al. (1974) used four classifications describing the status of threatened animals in Missouri.

"Endangered": An endangered species or subspecies is one whose prospects for survival within the state are in immediate jeopardy. Its peril may result from one or many causes--loss of habitat or change in habitat, overexploitation, predation, competition, disease. An endangered species must have help or extirpation will probably follow.

"Rare": A rare species or subspecies is one that, although not presently threatened with extirpation, is in such small numbers within the state that it could easily become endangered if its environment worsens. Close watch of its status is necessary.

"Status Undetermined": A status undetermined species or subspecies is one that has been suggested by competent authority as possibly rare or endangered, but about which there is not enough information to determine its

status. More information is needed, but it should be considered rare or endangered until its definite status is established.

"Extirpated": An extirpated species or subspecies is one that formerly occurred in Missouri, but at this time is not known to exist within the state. Extirpated species still occur elsewhere and could become established in Missouri if conditions become favorable.

Wisconsin. Hine et al. (1973:5) used the following three categories to classify existing knowledge on Wisconsin animals.

"Endangered": Species that are in trouble. Their prospects of reproduction and survival within the state are in jeopardy, and without help they may become extirpated.

"Changing Status": Species that may or may not be holding their own at the present time. They will be under special observation to identify conditions that could cause their further decline, or factors that could help insure their survival in the state.

"Extirpated": Species that have disappeared from the state. Species listed here are those that have become extirpated since 1800. (This is different from the term "extinct," which means the total loss of the species in the world.)

Iowa and Minnesota. Miller (1973:240) used the following definitions in describing the status of the threatened fish of the United States, including Iowa and Minnesota.

"Endangered": Actively threatened with extinction. Continued survival unlikely without the implimentation of special protective measures.

"Rare": Not under immediate threat of extinction, but occurring in such small numbers and/or in such

restricted or specialized habitat that it could quickly disappear. Requires careful watching.

References

As a result of the abbreviated time period available for preparation of this report, the author was unable to cite all the literature pertinent to the species mentioned herein. In order to assist the reader in more detailed search of the literature, an effort was made, whenever possible, to cite references which themselves were more inclusive in nature and contained extensive literature reviews.

FISHES

The species listed in this section were selected from OESIA (1973), Lopinot and Smith (1973), Miller (1972), Holt et al. (1974), and Hine et al. (1973). Unless otherwise referenced, information on distribution and habitat requirements was compiled directly from Smith et al. (1971), Pflieger (1971), Lopinot and Smith (1973) and Eddy (1969). The species are arranged taxonomically by families and alphabetically by genera and species from "A List of Common and Scientific Names of Fishes from the United States," American Fisheries Society Special Publication No. 6 (Bailey et al. 1970).

AMERICAN BROOK LAMPREY

Lampetra lamottei (Lesueur)

(Mo.-Rare)

Although this small lamprey is common in small streams northward from Missouri and Tennessee, and from Maryland to Connecticut (Eddy 1969:31), it does not occur in the Mississippi River itself (Pflieger 1971, Smith et al. 1971). Lampetra lamottei was extirpated from the Illinois River and its bottomland lakes between 1908 and 1970 (Starret 1972:163).

LAKE STURGEON

Acipenser fulvescens Rafinesque

(U.S.-Threatened; Ill.-Rare; Ia.-Rare and Endangered; Mn.-Rare; Mo.-Endangered)

The lake sturgeon occurs in freshwater lakes, streams and large rivers (Pflieger 1971:315) in the Great Lakes and Upper Mississippi drainages, and in the Saskatchewan and Hudson Bay drainages (Eddy 1969:37). Forbes and Richardson (1920:25) state that the lake sturgeon inhabits "comparatively shoal waters, ascending streams in the spring to spawn." Smith (1965:6) states that the lake sturgeon occurs sporadically in large rivers throughout Illinois. In 1966, commercial fishermen secured specimens from the Mississippi River near Quincy, Illinois and Elsberry, Missouri (Smith et al. 1971:5). Supplemental records exist for Mississippi River pools 4, 8-10 (UMRCC 1953), and pools 3, 6, 17, 19, 20 and 22 (Nord 1967).

Forbes and Richardson (1920:26) indicate that 2,145 pounds of lake sturgeon was taken from the Illinois River in 1894, and that portion of the Mississippi River bordering Illinois furnished 37,366 pounds in the same year. In 1899, the Illinois River product had fallen to 635 pounds, and in 1903 no lake sturgeon were reported at all from the Illinois.

Although early fisherman took large numbers of lake sturgeon for sale, great numbers were also caught and destroyed because they

damaged gear fished for other species. They were easy to catch, and as a result of their slow growth and late maturity, they were reduced to insignificance (OESIA 1973:7). Pflieger (1971:315) suggests that the marked decrease in abundance which this species has undergone could have resulted from overfishing, increased siltation, and/or construction of dams which block its movements and destroy its habitat.

PALLID STURGEON

Scaphirhynchus albus (Forbes and Richardson)

(U.S.-Status Undetermined; Ill.-Rare; Ia.-Rare and Endangered; Mo.-Endangered)

The extremely rare pallied sturgeon occurs in the Missouri and lower Mississippi Rivers, ascending the Mississippi River only a few miles upstream from the mouth of the Missouri (Pflieger 1971:316). The only recent collections in the study area were made in the Mississippi River in 1944 near the mouth of the Missouri (Barnickol and Starrett 1951:290) and in the spring of 1970 at river mile 75 (Smith et al. 1971:5). According to Pflieger (1971:316) its habitat seems to be much like that of the shovelnose sturgeon, Scaphirhynchus platorynchus (Rafinesque).

SHOVELNOSE STURGEON

Scaphirhynchus platorynchus (Rafinesque)

(Mn.-Rare)

The shovelnose sturgeon is taken occasionally from Lake Pepin

to the mouth of the Ohio (Smith et al. 1971:5) and is known from the larger tributaries of the Mississippi (Eddy 1969:35). Supplemental records exist for pools 4 (UMRCC 1965), 5-6 (UMRCC 1968), 7-9, 12, 14, 18-20, 25, 26 (UMRCC 1955), 10, 11, 13 and 15 (UMRCC 1960). This sturgeon inhabits the open channels of large rivers, and is usually found in a strong current over a firm sand or gravel bottom (Pflieger 1971:315).

PADDLEFISH

Polyodon spathula (Walbaum)

(Mn.-Rare; Wis.-Changing Status)

The paddlefish is found in the larger streams and connected waters of the Mississippi drainage (Eddy 1969:38). It is taken in the Mississippi River occasionally from pool 9 downstream to the mouth of the Ohio but it is rare in the upper pools (Smith et al. 1971:5). Supplemental records exist for pools 4, 5 (UMRCC 1953), 6, 8 (Nord 1967), 9 (UMRCC 1958), 10-15, 17-20, 22, 24 (UMRCC 1963), and B-26* (Barnickol and Starrett 1951). Sparse occurrence in the Illinois River at Meredosia and Havana was indicated by the older records of Forbes and Richardson (1920:17).

The paddlefish now seems less abundant in the Mississippi River than formerly (Barnickol and Starrett 1951:291). Destruction of spawning

*Below Lock and Dam 26.

grounds and blocking movements by dams, along with overfishing, are probably the major factors responsible for this decline. A similar decline has occurred in the Missouri River, perhaps as a result of channelization and consequent elimination of backwaters. Inhabiting quiet pools and backwaters of large rivers, the paddlefish also thrives in large man-made impoundments if they have large tributaries that are suitable for spawning (Pflieger 1971:316-317).

ALLIGATOR GAR

Lepisosteus spatula Lacepede

(Ill.-Rare; Mo.-Rare)

The alligator gar is distributed throughout the Gulf drainage and in the Mississippi River and some of its larger tributaries to St. Louis (Eddy 1969:40). Barnickol and Starrett (1951:320) list a number of records for the lower Mississippi River and one as far upstream as Grafton, Illinois. Recent records in the study area include two specimens taken from the Mississippi River by Illinois commercial fishermen in 1965: one specimen from Chester, the other from Cairo (Smith et al. 1971:5). Starrett (1972:163) indicated that the alligator gar was extirpated from the Illinois River between 1908 and 1970. The alligator gar inhabits the sluggish pools and overflow waters of large rivers (Pflieger 1971:317).

AMERICAN EEL

Anguilla rostrata (Lesueur)

(Wis.-Changing Status)

The American eel occurs in brackish water along both the Atlantic and Gulf coasts and enter the rivers often penetrating to the headwaters. It is a catadromous fish, living in freshwater but spawning in the deep Atlantic near Bermuda (Eddy 1969:43). In the Mississippi River, this fish is taken occasionally from pool 3 to the mouth of the Ohio (Smith et al. 1971:5). Supplemental records are available for pools 3 (author, unpublished), 5, 12, 13, 22 (UMRCC 1964), 7, 21, 24, 25 (UMRCC 1963), 8 (UMRCC 1953), 9 (UMRCC 1955), 10 (UMRCC 1957), 11 (UMRCC 1965), 14, 16, 17, B-26 (Barnickol and Starrett 1951), 15 (UMRCC 1966), 18 (UMRCC 1961) and 19 (UMRCC 1960). The American eel occurs in a variety of stream types but is most abundant in medium or large streams with continuous flow and moderately clear water. It is most often found in the deeper pools near logs, boulders or other cover (Pflieger 1971:320).

ALABAMA SHAD

Alosa alabamae Jordan and Evermann

(Ill.-Rare; Mo.-Rare)

Anadromous, occurring along the Gulf from the Suwanne River to the Mississippi (Eddy 1969:45), the Alabama shad is extremely rare in the study area, represented by one small specimen taken in

1962 in a seine haul at river mile 152 (Smith et al. 1971:5). Lopinot and Smith (1973:10) suggest that navigation dams now blocking the upstream migration and also pollution are the probably causes of the decline of this species.

SKIPJACK HERRING

Alosa chrysochloris (Rafinesque)

(Wis.-Extirpated)

The skipjack herring occurs along the Gulf of Mexico, entering various river systems including the Mississippi (Eddy 1969:44). It is moderately common in the Mississippi River near the mouth of the Ohio and occasional as far upstream as pool 15 (Smith et al. 1971:5). Supplemental records exist for pools 13 (UMRCC 1958), 16, 17 (Nord 1967) and 20, 21 (Barnickol and Starrett 1951). Inhabiting open waters of large rivers, the skipjack herring seems intolerant of extreme turbidity as indicated by a paucity of records for the Mississippi River downstream from the mouth of the Missouri (Pflieger 1971:321).

CISCO or LAKE HERRING

Coregonus artedii Lesueur

(Ill.-Rare; Wis.-Changing Status)

The cisco or lake herring normally occurs only in the Great Lakes and large deep lakes of the northern United States and Canada (Eddy 1969:58). In 1903, however, this species was caught in the

upper Illinois River (Starrett 1972:147). Since this record coincides with the opening of the Chicago Ship and Sanitary Canal in 1900 (Starrett 1972:146) and a subsequent influx of water from Lake Michigan, and since no further records are known, it should be considered accidental. Smith et al. (1971:10) state that Coregonus artedii does not naturally occur in the Mississippi River.

OZARK MINNOW

Dionda nubila (Forbes)

(Wis.-Endangered)

The Ozark minnow occurs from Wyoming to Illinois and south to the Ozarks (Eddy 1969:95). It has disappeared from the Illinois River since 1908 (Starrett 1971:154) and is probably accidental in the Mississippi. A specimen of Dionda nubila was seined at river mile 63 and another at mile 121 in 1963, both on the Illinois side of the river. If these fish came from tributaries, they crossed the river because the Ozark minnow, while common in Missouri streams, is not otherwise known from southern Illinois (Smith et al. 1971:6). This minnow inhabits streams with silt-free bottoms and a permanent flow of clear, cool water (Pflieger 1971:363).

BRASSY MINNOW

Hybognathus hankinsoni Hubbs

(Mo.-Rare)

The brassy minnow ranges from Montana to Lake Champlain and

southward to Nebraska, Missouri and Colorado (Eddy 1969:96). It has been recorded from pools 3, 4, 6 and 9 (UMRCC 1953) and also from several sites upstream from pool 1 (Underhill 1957). The brassy minnow inhabits small, moderately clear, low-gradient streams with permanent pools and bottoms of sand or fine gravel (Pflieger 1971:364).

STURGEON CHUB

Hybopsis gelida (Girard)

(Ill.-Rare; Mo.-Endangered)

The sturgeon chub occurs in the Missouri River drainage (Eddy 1969:101). In the Mississippi River, it is extremely rare and is confined to that part of the river below the mouth of the Missouri (Smith et al. 1971:6). The sturgeon chub inhabits the main channels of large silty rivers and occurs in swift current over a bottom of sand or fine gravel (Pflieger 1971:338). Bailey and Allum (1962:46) state that it is most often found over gravel.

SICKLEFIN CHUB

Hybopsis meeki Jordan and Evermann

(Ill.-Rare; Mo.-Endangered)

The sicklefin chub occurs in the Missouri River drainage (Eddy 1969:101). In the Mississippi River it is uncommon but is represented in several collections taken below the mouth of the Missouri (Smith et al. 1971:6). Its habitat is similar to that of the sturgeon chub (Pflieger 1971:338).

GRAVEL CHUB

Hybopsis x-punctata Hubbs and Crowe

(Wis.-Changing Status)

The gravel chub is distributed from southern Minnesota to Ohio and Oklahoma (Eddy 1969:103). It is rare in the Mississippi River but is represented in three recent minnow-seine collections made below the mouth of the Missouri (Smith et al. 1971:6). This minnow inhabits clear to moderately turbid streams with permanent flow and well defined gravel riffles, found most often in slight to moderate current over a silt-free gravel or rubble bottom (Pflieger 1971:334-335).

PALLID SHINER

Notropis amnis Hubbs and Greene

(Ill.-Rare; Mo.-Possibly Extirpated; Wis.-Changing Status)

The pallid shiner is distributed from southern Minnesota and Indiana to eastern Texas (Eddy 1969:136). It is rare at present in the Mississippi River, supplemental records existing for pools 3, 4, 5, 9, 11 (UMRCC 1953) and 21 (Smith et al. 1971:6). Inhabiting streams of medium to large size, the pallid shiner seems intolerant of siltation and turbidity, and it avoids strong currents (Pflieger 1971:353).

PUGNOSE SHINER

Notropis anogenus Forbes

(Ill.-Rare; Wis.-Endangered)

The pugnose shiner is distributed from eastern North Dakota to

the St. Lawrence drainage, including northern Illinois, Indiana and Ohio (Eddy 1969:126). The only record of occurrence in the study area is for Mississippi River pool 4 (UMRCC 1953) and Smith et al. (1971:6) considered this species accidental in the river. The pugnose shiner has been extirpated from the Illinois River and its bottomland lakes since 1908 (Starrett 1972:156).

BIGEYE SHINER

Notropis boops Gilbert

(Ill.-Rare)

The bigeye shiner occurs in most of the Ohio River drainage southwest into Oklahoma (Eddy 1969:134). Although it was represented in two recent minnow-seine collections from the Mississippi River made at river miles 43 and 327, Smith et al. (1971:6) regarded the bigeye shiner as probably accidental in the river. It is found characteristically in quiet pools having clear, warm water, a firm bottom that is relatively free of silt, and having much aquatic vegetation (Pflieger 1971:352). Lopinot and Smith (19753:30) suggest siltation, turbidity and disappearance of aquatic vegetation as reasons for population declines.

GHOST SHINER

Notropis buchanani Meek

(Wis.-Extirpated)

The ghost shiner is distributed through southern Minnesota to

the Ohio River drainage and south to Texas and Mexico (Eddy 1969:136). It is occasional in large rivers and lower reaches of their major tributaries throughout Illinois (Smith 1965:7). In the Mississippi River, it is widely distributed and rather common below pool 14, but it has become quite rare and is believed to be extirpated above pool 14 (Hine et al. 1973:21). Supplemental records, all over 20 years old, exist for the upper pools (UMRCC 1953), pool 26 and B-26 (Smith et al. 1971:7). The ghost shiner inhabits the low-gradient sections of large creeks and rivers having permanent flow and moderately clear water. A quiet-water species, it is found in the larger pools and the lower reaches of tributaries or other protected backwaters where there is no noticeable current (Pflieger 1971:363).

STRIPED SHINER

Notropis chrysocephalus (Rafinesque)

(Wis.-Changing Status)

The striped shiner occurs from the Southern Great Lakes and St. Lawrence drainages south to Oklahoma, northern Alabama and Georgia (Eddy 1969:110-111). Although present in several minnow-seine collections made in the Mississippi River below the mouth of the Missouri, Smith et al. (1971:7) believed the fish probably came from nearby small tributaries. In Missouri, Pflieger (1971:348) found the striped shiner most abundant in clear, permanent-flowing streams with clean gravel or rubble bottoms. He also states that it frequently occurs just below

riffles in a slight to moderate current but is more often found in nearby backwaters or short, rocky pools with little or no current.

BLACKCHIN SHINER

Notropis heterodon (Cope)

(Ill.-Rare)

The blackchin shiner is distributed from North Dakota to Quebec and south to New York and Iowa (Eddy 1969:125). Although formerly occurring in the Illinois River and its bottomland lakes, it has been extirpated from these areas since 1908 (Starrett 1972:156). It does not occur in the upper Mississippi River (Lopinot and Smith 1973:33, Pflieger 1971, Smith et al. 1971).

BLACKNOSE SHINER

Notropis heterolepus Eigenmann and Eigenmann

(Ill.-Rare; Ia.-Rare; Mo.-Endangered)

The blackchin shiner occurs from southern Canada to Maine and south to Iowa and the Ohio River drainage (Eddy 1969:125). Although formerly occurring in the Illinois River and its bottomland lakes, it has been extirpated from these areas since 1908 (Starrett 1972:156). It does not occur in the upper Mississippi River (Lopinot and Smith 1973:35, Pflieger 1971:499, Smith et al. 1971).

WEED SHINER

Notropis texanus (Girard)

(Wis.-Changing Status)

Eddy (1969:139) describes disjunct populations of the weed shiner: the first occurring from Georgia and western Florida to Texas and up the Mississippi drainage to southeastern Missouri; the second occurring from Minnesota and Michigan into Iowa and Illinois. Smith et al. (1971:7) do not consider Notropis texanus common in the upper Mississippi River. It is reported from pools 5-11 (UMRCC 1953) and 12 (Nord 1967). Harlan and Speaker (1969:83) reported this species from two localities on the Mississippi River in northeastern Iowa and predicted probable occurrence throughout the downstream slough areas of the Mississippi. An old record exists for the river at St. Louis (Pflieger 1971:349). Starrett (1972:156) reported the weed shiner as extirpated from the Illinois River and its bottomland lakes since 1908. It occurs most abundantly in large ditches and lowland rivers having noticeable current, a sandy bottom and little or no aquatic vegetation (Pflieger 1971:349).

PUGNOSE MINNOW

Opsopoeodus emiliae Hay

(Mo.-Endangered)

The pugnose minnow occurs from southern Minnesota to Michigan and south to Florida and Texas (Eddy 1969:93). Prior to 1945, it was collected from the Mississippi River from two locations above the mouth of the Missouri (Pflieger 1971:479), but there have been no recent collections. Opsopoeodus emiliae thrives only in clear waters where

there is an abundance of aquatic vegetation and no noticeable current, and is found usually in lentic environments or the quiet pools of low-gradient streams (Pflieger 1971:331). Noting a substantial reduction in the abundance of the pugnose minnow in Ohio, Trautman (1957: 335-337) attributed the decline to increased turbidity and siltation, and to the disappearance of aquatic vegetation.

BLUE SUCKER

Cycleptis elongatus Lesueur

(Mo.-Rare)

The blue sucker is found in large rivers from southern Minnesota and Wisconsin to Tennessee and Mexico (Eddy 1969:145). It is found in the Mississippi River and the lower reaches of its major tributaries but is not common (Smith et al. 1971:8). Supplemental records exist for pools 4, 6-10 (UMRCC 1953), 5 (UMRCC 1964), 7, 11, 25 (Nord 1967), 15, 16, 21 and 24 (Barnickol and Starrett 1951). Inhabiting deep, swift channels, the blue sucker is tolerant of turbidity if current is sufficient to prevent deposition of silt on the firm sand, gravel and rubble bottoms over which it is usually found (Pflieger 1971:378). Coker (1930:183) noted the decline of the blue sucker in the upper Mississippi River following construction of the dam at Keokuk, Iowa.

RIVER REDHORSE

Moxostoma carinatum (Cope)

(Ill.-Rare)

The river redhorse is found from Minnesota to the St. Lawrence River south to Kansas, Alabama and western Florida (Eddy 1969:154). It was extirpated from the Illinois River between 1908 and 1970 (Starrett 1972:163). Although not presently occurring, Smith et al. (1971:10) suggested that the River redhorse will become an eventual addition to the upper Mississippi River fauna, entering by way of tributaries in which it now occurs. Pflieger (1971:388) noted that inhabiting pools of clear, medium-sized or large streams with permanent flow and clear gravelly bottoms, the river redhorse seemed to be less tolerant of turbidity, siltation and intermittant flow than any other redhorse found in Missouri.

BLACK REDHORSE

Moxostoma duquesnei (Lesueur)

(Wis.-Extirpated)

The black redhorse is found from southern Minnesota to Ontario and south to Alabama and Oklahoma in the Mississippi drainage and from the Great Lakes drainage to western Florida (Eddy 1969:154). It was extirpated from the Illinois River and its bottomland lakes between 1908 and 1970 (Starrett 1972:163) and is not found in the upper Mississippi (Pflieger 1971:512, Smith et al. 1971).

GREATER REDHORSE

Moxostoma valenciennesi Jordan

(Wis.-Endangered)

The greater redhorse is found from Minnesota and the Great Lakes and St. Lawrence drainages south to Iowa and Illinois but is absent in most of the Ohio River drainage (Eddy 1969:156). It is recorded from pools 5 (UMRCC 1964) and 8 (UMRCC 1953) of the Mississippi River (Smith et al. 1971:8). Hine et al. (1973:10) considered the greater redhorse one of the first fish to succumb to pollution or continuously turbid water.

BLUE CATFISH

Ictalurus furcatus (Lesueur)

(Wis.-Extirpated)

Occurring in large rivers from Minnesota and Ohio southward into Mexico, Eddy (1969:164) considered the blue catfish rare if not extinct in the north. It is taken occasionally from the Mississippi River below pool 26, but Smith et al. (1971:8) also considered it rare above the mouth of the Missouri with the northernmost recent record being for pool 13 (UMRCC 1958). Supplemental records exist for pools 13 (UMRCC 1958), 19 (Nord 1967), 20-22, 24, 25, B-26 (Barnickol and Starrett 1951) and 26 (Rock 1963). The blue catfish is principally an inhabitant of swift chutes and of pools having noticeable current although it also occurs in the open waters of large reservoirs (Pflieger 1971:393).

BROWN BULLHEAD

Ictalurus nebulosis (Lesueur)

(Mo.-Rare)

The brown bullhead occurs from North Dakota and Saskatchewan to Nova Scotia and south to Mexico and Florida, and is widely introduced elsewhere (Eddy 1969:166). Although it is listed as "rare" in Missouri (Holt et al. 1974), the brown bullhead is found in the study area in marginal lakes of the middle Illinois River (Smith 1965:8) and at several sites in the upper Mississippi River above pool 10 (Smith et al. 1971:8). Supplemental records exist for pools 2 (UMRCC 1965), 3, 5 (UMRCC 1964), 4 (UMRCC 1967), 6, 8, 9 (UMRCC 1953) and 26 (Barnickol and Starrett 1951:337-338). Except that it is less often found in flowing waters, the habitat of the brown bullhead is similar to that of the yellow bullhead, Ictalurus natalis (Lesueur), which is found in quiet, heavily vegetated backwaters and overflow pools, or in the open pools of the stream channel (Pflieger 1971:392).

SPRING CAVEFISH

Chologaster agassizi Putnam

(Ill.-Rare)

The spring cavefish is known from springs in southern Illinois, Kentucky and Tennessee (Eddy 1969:173). In the study area it occurs only in springs in the Mississippi River bluffs bordering the protected floodplain in western Union and Alexander Counties, Illinois (Lopinot and Smith 1973:40).

BURBOT

Lota lota (Linnaeus)

(Mo.-Rare)

The burbot ranges through the Great Lakes region and extreme northern Mississippi drainage of Wisconsin and Minnesota, and the upper Missouri River drainage, northwestward into Alaska and Siberia (Eddy 1969:176). Rare in the Mississippi River, one recent specimen was taken in a hoopnet near New Boston, Illinois late in 1969 (Smith et al. 1971:9). Supplemental records are available for pools 3, 5, 9, 11, 25 (Nord 1967), 4 (UMRCC 1964) and 8 (UMRCC 1953). It is found sporadically in the Illinois River (Smith 1965:9). Pflieger (1971: 401) suggested that population pressure or other factors result in occasional influx of this fish into Missouri waters from the north along the Mississippi River.

MISSISSIPPI SILVERSIDE

Menidia audens Hay

(Mo.-Rare)

The Mississippi silverside occurs in brackish water along the Gulf of Mexico ascending the Red River in Texas and the Mississippi River drainage as far as Tennessee (Eddy 1969:195). It is common in the Mississippi river downstream from the mouth of the Ohio, and is represented in the study area by a collection made at that point in 1963 (Smith et al. 1971:9). Inhabiting the open waters of large,

moderately clear rivers, the Mississippi silverside is most readily seined at night, suggesting that it moves inshore during the hours of darkness and returns to deeper water in the daytime (Pflieger 1971:408).

BANDED PIGMY SUNFISH

Elassoma zonatum Jordan

(Ill.-Rare)

The banded pigmy sunfish is found from southern Illinois to Texas and Florida (Eddy 1969:209). Within the study area, it occurs only in a swamp in the protected floodplain at the La Rue-Pine Hills Ecological Area of the Shawnee National Forest in western Union County, Illinois (Gunning and Lewis 1955, Lopinot and Smith 1973:44-45). It inhabits quiet, clear waters with thick growths of aquatic vegetation (Pflieger 1971:420).

PUMPKINSEED

Lepomis gibbosus (Linnaeus)

(Mo.-Endangered)

The pumpkinseed is distributed from Manitoba and North Dakota to New Brunswick and south to South Carolina, Ohio and Iowa (Eddy 1969: 223). It is sporadic in occurrence in the middle Illinois River valley (Smith 1965:9) and common in the Mississippi River above pool 14 (Smith et al. 1971:9). Supplemental records exist for pools 3-5 (UMRCC 1964), 6 (UMRCC 1953), 10, 11, 14 and 16-19 (Nord 1967). The "endangered" classification in Missouri was based on collections made in only two

localities which were presumed to represent naturally occurring populations. If so, these are the southernmost localities in the Mississippi Valley for this northern species. The pumpkinseed is most often found in clear quiet waters having dense growths of aquatic vegetation (Holt et al. 1974).

LONGEAR SUNFISH

Lepomis megalotis (Rafinesque)

(Wis.-Changing Status)

The longear sunfish is found from Iowa to southern Quebec and south to South Carolina and into Mexico (Eddy 1969:220). It is represented in recent minnow-seine collections made near the mouth of the Ohio River, but it is uncommon in the upper Mississippi (Smith et al. 1971:9). It was extirpated from the Illinois River and its bottomland lakes between 1908 and 1970 (Starrett 1972:163). The longear sunfish inhabits clear, permanent-flowing streams having bottoms mostly of sand, gravel or rubble. Although the habitats where it occurs often have considerable aquatic vegetation, this is not essential. This species is found in small headwater creeks and moderately large rivers, but is most abundant in streams of medium size. The longear sunfish avoids strong currents and is found most commonly in pools, protected inlets and overflow waters (Pflieger 1971:416).

BANTAM SUNFISH

Lepomis symmetricus Forbes

(Ill.-Rare; Mo.-Rare)

The bantam sunfish occurs from southern Illinois to Louisiana and Texas (Eddy 1969:218). It was extirpated from the Illinois River and its bottomland lakes between 1908 and 1970 (Starrett 1972:163). Smith et al. (1971:10) suggested that it had become so rare as no longer to be a probable addition to the Mississippi River fauna. In the study area, the only recent record of the bantam sunfish is in a swamp in the protected floodplain at the La Rue-Pine Hills Ecological Area of the Shawnee National Forest in western Union County, Illinois (Gunning and Lewis 1955, Lopinot and Smith 1973:47). Pflieger (1971: 413) found that the bantam sunfish at Duck Creek Wildlife Area in Bollinger County, Missouri, inhabits clear, quiet water having much submerged vegetation and standing timber. This description also fits the swamp at the Pine Hills.

WESTERN SAND DARTER

Ammocrypta clara Jordan and Meek

(Ill.-Rare; Ia.-Rare)

The western sand darter is found from southern Minnesota to Indiana and southward to eastern Texas (Eddy 1969:226). It occurs in the Mississippi River between Lake Pepin and the mouth of the Missouri and is locally common (Smith et al. 1971:9). Supplemental records are

available for pools 5 (UMRCC 1967), 6-8, 10, 11 (UMRCC 1953) and 16 (Nord 1967). It is not recorded for the Illinois River (Lopinot and Smith 1973:49). Invariably found on a bottom composed of fine, silt-free sand, the western sand darter avoids strong currents, occupying the quiet margins of the channel and shallow backwaters (Pflieger 1971: 428).

AMPHIBIANS AND REPTILES

The species considered in this section were determined from OESIA (1973), INPC (1971), Holt et al. (1974) and Hine et al. (1973). Unless otherwise referenced, information regarding nomenclature, distribution, range and ecological requirements was taken from Conant (1958), Smith (1961) and Anderson (1965).

HELLBENDER

Cryptobranchus alleganiensis alleganiensis (Daudin)

(Ill.-Endangered)

The hellbender is a nocturnal, permanently aquatic salamander which found in fast running water of rivers and large creeks. It occurs in southeastern Illinois and northern Alabama northeastward to central New York, and is also found in central and southern Missouri (Smith 1961:26-27). The presumed range intersects the study area at the confluences of the Ohio and Mississippi Rivers and of the Missouri and Mississippi Rivers but documentation of collections in these locations was unavailable. Siltation, and thermal and general pollution are eliminating it from much of the Ohio drainage according to Dundee (1971). It no longer reproduces in Illinois at least partially due to construction of dams and subsequent siltation (Terpening et al. 1974:183).

MOLE SALAMANDER

Ambystoma talpoideum (Holbrook)

(Ill.-Rare)

The range of the mole salamander extends from South Carolina to northern Florida and Louisiana. Disjunct colonies occur in southeastern Oklahoma, southern Illinois to western Tennessee and Arkansas, and in the valleys of western North Carolina and adjacent Tennessee (Conant 1958:211). In the study area, it probably occurs from the mouth of the Ohio River along the Mississippi floodplain to Jackson County, Illinois. In the adult stage, it is a burrowing species but can also be found in damp places such as within or under rotten logs in cypress swamps (Smith 1961:35). Populations are often localized around suitable breeding ponds (Shoop 1964) and larvae may inhabit crawfish burrows (Neill 1951:765).

DUSKY SALAMANDER

Desmognathus fuscus conanti Rossman

(Ill.-Endangered)

Desmognathus fuscus ranges from New Brunswick to eastern Texas and eastward to the Atlantic and Gulf coasts excluding southern Florida (Conant 1958:341). Its range in Illinois, however, is restricted to the extreme southern tip of the state, represented by the subspecies, D.f. conanti (Rossman 1958:160). The only reported collection of the dusky salamander in the study area (Smith 1948:2)

was made in 1935 near Aldredge, Union County, Illinois. This is adjacent to the La Rue-Pine Hills Ecological Area of the Shawnee National Forest. Since that time, repeated attempts to locate the dusky salamander have been unsuccessful. It occurs in cold springs and is usually encountered raking wet leaves or raising rocks at the margin of a spring or stream (Smith 1961:60-61).

DARK-SIDED SALAMANDER

Eurycea longicauda melanopleura (Cope)

(Ill.-Rare)

The dark-sided salamander occurs in the Ozarks and adjacent areas, intergrading with the long-tailed salamander, Eurycea longicauda longicauda (Green), in Illinois and southeast Missouri (Conant 1958: 249). In the study area, the dark-sided salamander is found in rocky streams, caves and springs of the Mississippi River bluffs and dissected uplands in Adams and Pike Counties, Illinois, intergrading with the long-tailed salamander southward to Union County (Smith 1961: 48).

FOUR-TOED SALAMANDER

Hemidactylium scutatum (Schlegel)

(Ill.-Rare; Mo.-Rare)

The four-toed salamander ranges from Nova Scotia to Wisconsin and Alabama. Its distribution is spotty, in the south with disjunct populations in Missouri, Arkansas, Louisiana and Georgia (Conant 1958:

237). Its occurrence in the study area is doubtful although presumed range includes Jo Daviess County, Illinois northward into Wisconsin bordering on the Mississippi River (Smith 1961:51). The Missouri record nearest the study area was six miles southwest of Weingarten, Ste. Genevieve County (Smith 1956:463). The four-toed salamander is reportedly a bog animal, occurring under logs, bark or sphagnum (Smith 1961:52). Sphagnaceous areas adjacent to woods and boggy woodland ponds are common habitats (Conant 1958:237). Smith (1956: 463) collected the Missouri specimens near a cold spring under flat rocks within a steep-sided, mesic ravine which appeared protected from excessive temperature and drought in the summer.

EASTERN SPADEFOOT

Scaphiopus holbrooki (Harlan)

(Ill.-Rare)

The eastern spadefoot toad ranges from southern New England to southern Florida including Key West and west to southeastern Missouri, Arkansas and Louisiana; it is absent from most upland areas in the South (Conant 1958:253). In the study area, its distribution is restricted along the Mississippi River in Alexander, Union, Jackson and Monroe Counties, Illinois (Smith 1961:70, Thompson et al. 1968: 427). The eastern spadefoot is subterranean and is usually found only in breeding ponds although some specimens are obtained by following farmers' plows or raising logs (Smith 1961:70). It is usually

found in areas characterized by sandy or other loose soils (Conant 1958:253). Eggs are laid in short, irregular strings, attached to vegetation in temporary pools or flooded fields.

BULLFROG

Rana catesbeiana Shaw

(Wis.-Changing Status)

Ranging throughout most the eastern half of the United States, the bullfrog is common in the study area (Smith 1961:97). It is included here for completeness as it was listed under "changing status" by Hine et al. (1973:15-16). According to Hine, "This large frog was greatly reduced in numbers by 'frog-farming' in the 1920's, but appeared to be increasing in numbers as of the mid-1960's. Fairly stable local populations can now be found scattered throughout the state in undisturbed ponds and lakes with large dense beds of aquatic plants."

WOOD FROG

Rana sylvatic Le Conte

(Ill.-Rare; Mo.-Endangered)

Rana sylvatica is transcontinental in North American distribution, occurring mainly in the east and far north. The presumed range of the wood frog in the study area extends from southern Jackson County, Illinois, northward along the Mississippi River to southern

Jersey County where it is discontinued until Rock Island County. From this point it proceeds northward to the Arctic (Smith 1961:110). One old record exists for Peoria County along the Illinois River (Garman 1892:330). Smith (1961) considered the disjunct populations separate subspecies, R.s. sylvatica in the south, and R.s. cantabrigensis in the north. Martof (1970), however, does not agree that such separation justified. Usually solitary in habits, the wood frog is restricted to relatively mesic forests in which there are permanent or semipermanent pools. In spring and fall the wood frog may be aquatic, but most of the summer is spent well away from water (Smith 1961:110).

EASTERN NARROW-MOUTHED TOAD

Gastrophryne carolinensis (Holbrook)

(Ill.-Rare)

The eastern narrow-mouthed toad ranges from southern Maryland to the Florida Keys, west to Missouri and eastern Texas (Conant 1958: 295), with an isolated colony in southeastern Iowa (Klimstra 1950). In the study area, it has been reported from the Mississippi River bluffs of Monroe and Randolph Counties, Illinois (Smith 1961:113), the Mississippi backwaters of Monroe County, and Jackson and Union Counties, Illinois (Terpening et al. 1974). Anderson (1954) found moisture to be the most critical habitat requirement in an ecological study of Louisiana narrow-mouthed toads from swamps and river levees. This small toad is found usually in rotten stumps, or under flat rocks,

bark or other moist objects on the ground (Smith 1961:112).

WESTERN BIRD-VOICED TREEFROG

Hyla avivoca avivoca Viosca

(Ill.-Rare)

The western bird-voiced treefrog occurs in the Mississippi Valley, chiefly east of the River, north to extreme southern Illinois and east into southwestern Georgia. It is a resident of permanent wooded swamps of species such as cypress, Taxodium distichum, and buttonbush, Cephalanthus occidentalis (Conant 1958:282). In the study area, the western bird-voiced treefrog extends southward from extreme southern Jackson County, Illinois, through the floodplain swamps of western Union and Alexander Counties where it is abundant. Apparently, it does not occur in Missouri (Smith 1966a). Breeding individuals are found in the cypress swamps above water on vines, tree branches or stems of buttonbrush (Smith 1961:87).

GREEN TREEFROG

Hyla cinerea (Schneider)

(Ill.-Rare)

The green treefrog ranges from Delaware to the Florida Keys, west in the Gulf Coastal Plain to central and southern Texas and north to extreme southern Illinois (Conant 1958:279). In the study area, it is found only along the floodplain of the Mississippi River

in extreme southwestern Jackson, and western Union and Alexander Counties, Illinois, where it occurs in cypress swamps, along floodplain sloughs and in cattail marshes (Smith 1961:88, Cagle 1943:180). Occurrence in limited numbers is reported for the La Rue-Pine Hills Ecological Area (Gunning and Lewis 1955:553).

ILLINOIS CHORUS FROG

Pseudacris streckeri illinoensis Smith

(U.S.-Status Undetermined; Ill.-Rare)

First described by Smith (1951:190) from a specimen collected three miles north of Meredosia, Morgan County, Illinois, the Illinois chorus frog has been found only in small, isolated populations in Arkansas, southeast Missouri, southwest Illinois and six counties along the Illinois River (Smith 1966 b). Collections from both Scott County, Missouri (Smith 1955), and Alexander County, Illinois (Holman et al. 1964), were made in the Mississippi River floodplain on opposite sides of the River. The collections from Scott, Morgan, Cass, Mason and Tazewell Counties, Illinois (Smith 1961:85), were made in sand prairie areas, some adjacent to the Illinois River. Sand prairies appear to be the preferred habitat.

ALLIGATOR SNAPPING TURTLE

Macroclemys temmincki (Troost)

(Ill.-Endangered; Mo.-Rare)

The alligator snapping turtle ranges from southern Georgia and

northern Florida to central Texas, and north in the Mississippi Valley to Kansas, Illinois and southwest Indiana (Conant 1958:35). In the study area, its presumed range extends from Cairo, Illinois, up the Mississippi River to Whiteside County, Illinois, and up the Illinois River to Mason County, Illinois (Smith 1961:121-122). In 1960, a specimen weighing 150 pounds, was taken from the Big Muddy River 7.5 miles from its confluence with the Mississippi just below Grand Tower, Illinois (Galbreath 1961). The alligator snapping turtle can be found in lakes, rivers, streams or swamps apparently preferring muddy bottoms.

ILLINOIS MUD TURTLE

Kinosternon flavescens spooneri Smith

(Ill.-Kare)

The Illinois mud turtle was first described as a distinct subspecies by Smith (1951). It is known only from a few isolated populations in the sand prairie region along the Illinois River, the Oquawka sand area in Illinois, Lewis County, Missouri, and Muscatine County, Iowa (Anderson 1965:17). Smith (1961:127) suggests the species may also occur in sand prairie ponds and sloughs of the upper Mississippi River. It seems to prefer backwater sloughs and sand prairie ponds with silty bottoms. Smith (1961:127) considered K. f. spooneri "one of the striking examples of a relict xerothermic period*

*A postglacial period of warm and arid conditions.

animal. The closest relative occupies the Great Plains from eastern Kansas westward. As a result of climatic changes occurring in the Prairie Penninsula, the race spooneri has evidently been reduced to a few small remnant colonies."

MUD TURTLE

Kinosternon subrubrum subrubrum (Lacepede) X hippocrepis Gray

(Ill.-Rare)

The eastern mud turtle, Kinosternon subrubrum subrubrum, ranges from southwestern Connecticut and Indiana to the Gulf Coast. The western mud turtle, Kinsternon subrubrum hippocrepis, ranges from Missouri to Louisiana and east-central Texas (Conant 1958:40-41). The few Illinois specimens available are intermediate between eastern and western subspecies (Smith 1961:127). In the study area, the mud turtle is presumed to occur from Cairo, Illinois, to the junction of the Mississippi and Kaskaskia Rivers. Records also exist for Calhoun and Peoria Counties, Illinois, along the Illinois River. In southern Illinois, optimum habitat for the mud turtle occurs in sections of pin oak flatwoods that annually accumulate enough water to allow development of bald cypress, buttonbush, swamp cottonwood (Populus heterophylla), and black willow (Salix nigra), with swamp white oak (Quercus bicolor) and pin oak (Q. palustris) also important. Skorepa and Ozment (1968) discovered that this primarily aquatic turtle is abundant in the temporary ponds of such areas but has been rarely

collected because it burrows into the ground each spring to escape dessication when the ponds dry.

SPOTTED TURTLE

Clemmys guttata (Schneider)

(Ill.-Possibly Extirpated)

The spotted turtle ranges from southern Maine to extreme eastern Illinois, and south in the East to Georgia (Conant 1958:42). The three specimens from Illinois mentioned by Smith (1961) represent the westernmost records for this species. One specimen was taken at Romeoville in Will County, part of the study area. As this record is almost 40 years old, and considering the intense urbanization that has occurred in northeastern Illinois, it is extremely unlikely that the spotted turtle still occurs in the study area. Generally it is found in marshy meadows, bogs, swamps, small ponds, ditches or other shallow bodies of water (Conant 1958:42). In northern Indiana, it inhabits bogs (Smith 1961:130).

BLANDING'S TURTLE

Emydoidea blandingii (Holbrook)

(Mo.-Possibly Extirpated)

Blanding's turtle ranges from Nova Scotia to Nebraska with a discontinuous range that is spotty east of Ohio and Ontario (Conant 1958:65). In the study area, it is known from Clark County, Missouri,

northward (Anderson 1965:24) and from Morgan to Cook Counties along the Illinois Waterway (Smith 1961:132). Semiaquatic in habits, Blanding's turtle is found in marshy areas along slow streams and shallow sloughs from which it also frequents the adjacent land.

ORNATE BOX TURTLE

Terrapene ornata (Agassiz)

(Wis.-Endangered)

The ornate box turtle occurs from Indiana to southeastern Wyoming and south through Texas; the range is discontinuous toward the northeast (Conant 1958:45). In the study area it occurs along the lower half of the Illinois River, from Tazewell to Calhoun Counties, and along the Mississippi River from Calhoun to Randolf Counties, Illinois. It also occurs along the Mississippi River from Mercer to Carroll Counties, Illinois (Smith 1961:138). Anderson (1965) considered it common throughout Missouri excluding the bootheel. Often found in sandy areas and more tolerant of arid conditions, the ornate box turtle is the prairie-loving counterpart of its forest-loving relative T. c. carolina, the eastern box turtle (Smith 1961:138). Although it has always been limited in its Wisconsin distribution to the sandy areas in the southwestern portion of the state (Hine et al. 1974:9), it is not uncommon in the portions of the study area in which it occurs.

HIEROGLYPHIC TURTLE

Pseudemys concinna hieroglyphica (Holbrook) X floridana hoyi (Agassiz)

(Ill.-Rare)

The hieroglyphic turtle is a hybrid of the slider and the Missouri slider. The slider ranges from southern Indiana and Illinois to central Alabama and Mississippi, northern Louisiana, and extreme eastern Texas. The Missouri slider ranges from southern Illinois and southeastern Kansas to the central Texas Gulf and east to Alabama (Conant 1958:316). The rare hybrid occurs in Illinois along the Wabash, Ohio and Mississippi Rivers and their backwaters (Smith 1961). In the study area, it might be expected to occur along the Mississippi River from the mouth of the Ohio to the mouth of the Illinois.

SIX-LINED RACE RUNNER

Cnemidophorus sexlineatus (Linnaeus)

(Wis.-Changing Status)

The six-lined race runner is found extensively throughout the southeast and south central United States. The range of this lizard penetrates the Illinois and Mississippi River valleys well outward from its main body including the entire study area (Conant 1958:324). Habitat of the six-lined race runner appears restricted to dry areas such as sand prairies and hill prairies (Smith 1961:166). In Wisconsin, the six-lined racer runner is locally common on sandy areas in the western part of the state, and also present on some rocky outcrops

and bluffs, but uncommon there. The Wisconsin populations are threatened by irrigation, cultivation and forest plantings, and by collecting for sale as pets (Hine et al. 1974:15)

WESTERN SLENDER GLASS LIZARD

Ophisaurus attenuatus attenuatus Cope

(Ill.-Rare)

The western slender glass lizard occurs from southern Wisconsin and northwestern Indiana to central Kansas, and south to southern Texas and Louisiana. Although it occurs primarily west of the Mississippi, it may be found throughout the study area as far northward as northeastern Iowa (Holman 1971). In Illinois and Missouri it is statewide in occurrence, but apparently rare throughout (Smith 1961:164, Anderson 1965:87). This snakelike lizard is terrestrial and somewhat fossorial, its burrowing habits perhaps accounting partly for its rarity in collections.

GREEN WATER SNAKE

Natrix cyclopion cyclopion (Dumeril, Bibron and Dumeril)

(Ill.-Rare; Mo.-Rare)

The green water snake occurs along the Gulf coast from western Florida to central Texas and up the Mississippi River drainage to southeastern Missouri and southern Illinois (Conant 1958:327). In the study area, the green water snake is known only from western

Alexander and Union Counties, Illinois (Smith 1961:244). Its presumed range includes Mississippi, Scott and Cape Girardeau Counties, Missouri (Anderson 1965:131). This species seems restricted to woodland swamp, having been found only in the Pine Hills-Wolf Lake Swamp. Extensive collecting in 1968 did not reveal any specimens outside of this area (Garton et al. 1970).

QUEEN SNAKE

Natrix septemvittata (Say)

(Mo.-Rare; Wis.-Endangered)

The range of the queen snake is from the southern Great Lakes region and southeastern Pennsylvania to the Gulf coast with an isolated population in Arkansas and southwest Missouri (Conant 1958:123). In the study area, this species occurs along the Illinois Waterway from Cook to Fulton Counties, Illinois (Smith 1961:257). A medium-sized, moderately stout bodied water snake, it is found usually along fast streams in open forest regions. Known locations from Fulton, Woodward and LaSalle Counties probably represent a southwestern extension of the Queen Snake's range along the wooded bluffs of the upper Illinois River (Smith 1961:257).

NORTHERN LINED SNAKE

Tropidoclonion lineatum lineatum (Hallowell)

(Ill.-Endangered)

The northern lined snake ranges from central Illinois to southeastern South Dakota, eastern Nebraska and northeastern Kansas. A disjunct population occurs in eastern Colorado and New Mexico (Conant 1958:329). This snake has been found near Great Bend along the Illinois River (Smith 1961:237) and in St. Louis and Jefferson Counties, Missouri, along the Mississippi (Anderson 1965:176). It is semifossorial in habits, found under rocks, logs or trash and lives chiefly on a diet of earthworms. Largely an urban dweller, most specimens of the northern lined snake have been found in yards or vacant lots in cities. Smith (1965:236) suggested that the present distribution east of the Mississippi River consists of relicts of the Xerothermic Period. He added, "The range of Tropidoclonion was probably reduced to scattered small colonies before Illinois was settled; cultivation and related practices in all likelihood have aided the climatic shifts in reducing the number of populations except those which by accident had cities grow up about them."

WESTERN HOGNOSE SNAKE

Heterodon nasicus Baird and Girard

(Ill.-Rare; Mo.-Endangered)

The western hognose snake ranges from Illinois to Alberta, south to southeastern Arizona and central Mexico (Conant 1958:139). In the study area, this species is restricted to the sand areas. It occurs in sand prairies along the Illinois River from Scott to Tazewell

Counties and along the Mississippi in Henderson, Mercer and Whiteside Counties, Illinois (Smith 1961:188). Several specimens have also been collected from sand areas in Mississippi and Scott Counties, Missouri (Anderson 1965:190). These populations are probably remnants of the Xerothermic Period (Smith 1965).

WESTERN WORM SNAKE

Carphophis amoenus vermis (Kennicott)

(Ill.-Rare; Mo.-Rare)

The western worm snake is found from southern Iowa and southeastern Nebraska to Louisiana (Conant 1958:144). In the study area, specimens have been obtained from St. Genevieve, Jefferson, St. Louis, St. Charles, and Lincoln Counties, Missouri (Anderson 1965:199) and for Calhoun, Adams and Hancock Counties, Illinois (Smith 1961:179), all of which border the Mississippi River. The western worm snake is fossorial in habits, found under rocks, logs or bark of stumps, seeking moist situations when the ground dries in the summer. It occurs along the Mississippi River bluffs and in the vicinity of rock outcrops (Smith 1961).

EASTERN COACHWHIP

Masticophis flagellum flagellum (Shaw)

(Ill.-Endangered)

The range of the eastern coachwhip is from North Carolina to

southern Florida, west to Texas, Oklahoma and Kansas (Conant 1958:150). In the study area, its presumed range extends from Cape Girardeau to St. Louis Counties, Missouri, and Randolf and Madison Counties, Illinois. This snake has been collected in Jefferson County, Missouri (Anderson 1965:213), and along the hill prairies on the Mississippi River bluffs at Fults, Monroe County, Illinois (Smith 1961:200). The eastern coachwhip utilizes a wide variety of habitats throughout its range including pine hills, open prairies and oak woodlands (Wilson 1973). In Missouri it occurs in both rough, rocky terrain in rather exposed situations, and also in open grassy areas on timbered hillsides (Anderson 1965:211).

SMOOTH GREEN SNAKE

Opheodrys vernalis (Harlan)

(Mo.-Rare)

The smooth green snake has an extensive range covering the Maritime provinces to southern Manitoba, southward in the East to northern New Jersey, through the mountains to North Carolina, and to Texas, New Mexico and Utah in the West (Conant 1958:152). Specimens have been collected from Monroe and Madison Counties, Illinois (Smith 1961:196), and St. Charles County, Missouri (Anderson 1965:220). From the latter location, this snake is presumed continuous in occurrence northward through Missouri. From Adams County, Illinois (Smith 1961) it is presumed to occur on either side of the Mississippi River

northward past the upper end of the study area. Its range is continuous along the upper two thirds of the Illinois waterway. A terrestrial prairie species often found under cover of rocks, boards or other debris, scattered colonies of smooth green snakes have been found mostly in wet meadows and vacant lots in suburban areas (Smith 1961: 195). Much of its original prairie habitat has been destroyed.

GREAT PLAINS RAT SNAKE

Elaphe guttata emoryi (Baird and Girard)

(Ill.-Rare)

The Great Plains Rat Snake occurs in southwestern Illinois to Utah, New Mexico and northeastern Mexico (Conant 1958:157). Specimens have been obtained from Randolf to Jersey Counties, Illinois (Smith 1961:202) and from Jefferson County, Missouri (Anderson 1965:224), all of which border the Mississippi River. Anderson (1965:222) described the habitat of this snake as rocky, timbered hillsides. Smith (1961:201) reports of the specimens taken in Illinois: one was seen in East St. Louis, St. Clair County; two were captured on the forested campus of Principia College near Elsah; and four were taken dead on the bluff road between Valmeyer, Monroe County, and Prairie du Rocher, Randolf County. "This road is bordered on one side by heavily farmed Mississippi floodplain, on the other by dry precipitous bluffs."

SCARLET SNAKE

Cemophora coccinea (Blumenbach)

(Ill.-Probably Extirpated; Mo.-Rare)

The scarlet snake ranges from southern New Jersey to the tip of Florida, west to Louisiana and eastern Oklahoma, with dijunct colonies in Texas and as far north in the Mississippi Valley as the southern parts of Indiana, Illinois and Missouri (Conant 1958:177). Only two locations are known for Missouri, neither in the study area (Anderson 1965:254). The only existing location from Illinois (Bennett 1953) came from what is now the La Rue-Pine Hills Ecological Area of the Shawnee National Forest in western Union County. The scarlet snake is unknown elsewhere in the study area. Despite heavy collecting efforts in the Pine Hills-Wolf Lake area, no further records of this secretive, burrowing species have been made (Smith 1961:224).

NORTHERN FLAT-HEADED SNAKE

Tantilla gracilis hallowelli Cope

(Ill.-Rare)

The northern flat-headed snake ranges through most of Missouri and eastern Kansas and south into Arkansas and Oklahoma with an isolated record in the Texas panhandle (Conant 1958:182). It has been located in Jefferson and St. Louis Counties, Missouri (Anderson 1965: 260), and also along the relatively arid Mississippi River bluffs of

Union, Monroe and St. Clair Counties, Illinois (Smith 1961:225). This small snake is strictly fossorial and is usually found by raising flat rocks in dry talus slides.

MASSASAUGA

Sistrurus catenatus (Rafinesue)

(Mo.-Rare)

The massasauga rattlesnake occurs from central New York and southern Ontario to Iowa and Missouri (Conant 1958:189). Its presumed range extends from Jackson County, Illinois, northward including almost the entire study area (Smith 1961:270). The preferred habitat is probably prairie marshes or old fields with heavy bluegrass cover although this small rattlesnake also occurs in bogs and other wooded areas.

TIMBER RATTLESNAKE

Crotalus horridus horridus Linnaeus

(Ill.-Endangered)

The timber rattlesnake has an extensive range in the East occurring from New England, through the central Appalachians and into the Midwestern states (Conant 1958:337). Its presumed range extends the entire length of the Mississippi River excluding Henderson and Mercer Counties, Illinois, to Jackson, Union and Alexander Counties where it intergrades with the canebrake rattlesnake, Crotalus horridus

atricaudatus (Smith 1961:272). The range of the timber rattlesnake also includes the lower Illinois River with older records as far upstream as Fulton, Peoria and LaSalle Counties. This large, stout-bodied snake is found among forested Mississippi River bluffs and where rock outcrops are extensive.

CANEBRAKE RATTLESNAKE

Crotalus horridus atricaudatus Latreille

(Mo.-Rare)

The canebrake rattlesnake has an extensive range through the southeast and Gulf Coast as far west as central Texas. It also ranges up the Mississippi Valley to southeastern Missouri and southern Illinois (Conant 1958:337). In Missouri, it has been collected in Scott County (Anderson 1961:294). Entering Illinois at Alexander, Union and Jackson Counties, the subspecies intergrades with C. h. horridus (Smith 1961:271). An inhabitant of bottomland, swamp and flatlands, this large rattlesnake has also been reported from uplands when near water.

BIRDS

The species listed in this section were determined from OESIA (1973), INPC (1971), Holt et al. (1974) and Hine et al. (1973). Unless otherwise referenced, information regarding nomenclature, distribution and range was taken from American Ornithological Union (1957 and 1973), Robbins et al. (1966) and Peterson (1947).

DOUBLE-CRESTED CORMORANT

Phalacrocorax auritus (Lesson)

(Ill.-Endangered; Mo.-Endangered; Wis.-Endangered)

The double-crested cormorant breeds in most of central and south central Canada from central Alberta eastward to the north shore of Lake Superior and into the United States south to a line from Utah through Texas to Maine. Freshwater lakes, ponds, rivers, swamps, and sloughs are habitats utilized by this bird (Palmer 1962). Isolated, undisturbed swamps and islands are required for breeding, and formerly it occurred in greater abundance breeding on the study area. The double-crested cormorant is still seen in wanderings and migrations on the study area as the Mississippi Valley appears to be a main flyway for it (Terpening et al. 1974:165). It winters from Tennessee southward in the Mississippi Valley and along the coasts. The double-crested cormorant is a high order consumer, feeding on fish, eels, crustraceans and other large aquatic organisms being thus susceptible

to biological concentration of persistent pesticides, such as DDT, a factor George (1971) suggests as responsible for their decline. Drought and human persecution can also be detrimental to this species.

WATER TURKEY (ANHINGA)

Anhinga anhinga (Linnaeus)

(Mo.-Extirpated)

The water turkey or anhinga occurs in lowland swamps of the South, northward to North Carolina, northeast Tennessee, Arkansas and occasionally as far north as southeastern Missouri, wintering in Florida and the Gulf States. Holt et al. (1974) considered the water turkey extirpated from Missouri, as it was restricted to hardwood and cypress swamp habitats in southeast Missouri which have undergone considerable change by drainage and timber harvest. Terpening et al. (1974), however, suggested that it might be considered endangered on the basis of occasional sightings and the small areas of cypress swamp habitat still remaining along the southern end of the study area.

LITTLE BLUE HERON

Florida caerula (Linnaeus)

(Ill.-Rare)

The little blue heron breeds from central Oklahoma, southeastern Arkansas, southeastern Missouri, northeastern Tennessee, and central Alabama south to the Gulf coast, and along the Atlantic Coast from Massachusetts to Florida. This heron has been observed from St. Louis

southward along the Mississippi, and is most probably restricted to the floodplain (Terpening et al. 1974:154). It may wander to points further north in the study area in the summer, but wintering is restricted to the coasts from Texas to Georgia southward. The little blue heron utilizes freshwater lakes, ponds, flooded fields and roadside ditches. It is usually gregarious in nesting and its nest is normally constructed in bushes or trees four to eight feet above the ground composed of sticks and twigs loosely jumbled together (Rue 1970: 122).

SNOWY EGRET

Leucophoyx thula (Molina)

(Ill.-Rare)

Breeding mainly in the west and along the coasts from New Jersey to Texas, the snowy egret is a rare summer visitor in the study area as far north as northeastern Iowa. Palmer (1962:459) indicated that normal breeding range as far north in the Mississippi River valley as northern Mississippi. The snowy egret occurs in fresh-, brackish- and saltwater marshes, perhaps favoring sheltered areas. Nesting is gregarious, occurring at freshwater ponds, marshes and lakes, with willow and buttonbush or willows, Phragmites, and bulrushes serving as nesting sites (Palmer 1962:457). Wintering occurs southward from Florida and northern Mexico to south America.

BLACK-CROWNED NIGHT HERON

Nycticorax nycticorax (Linneaus)

(Ill.-Rare)

Breeding black-crowned night herons can be found throughout most of the continental United States including the entire study area. It is known to winter as far north as the southern tip of Illinois. Its habitat is extremely varied with water of wading depth apparently the only essential requirement. Nesting habitat is likewise varied, including hardwood forests on offshore islands, swamps, cattail marshes, clumps of tall grass on dry ground and even an old apple orchard (Palmer 1962:476). The black-crowned night heron is gregarious at all seasons and active at night. Palmer (1962:483) suggests land-clearing, drainages, lumbering, development of real estate and other encroachments on the heron's habitat as reasons for its decline in many localities.

AMERICAN BITTERN

Botaurus lentiginosus (Rackett)

(Ill.-Rare)

Breeding American bitterns occur throughout most of the northern half of the United States and the southern half of Canada, including the entire study area. Although wintering range is generally south of the breeding range, some wintering bitterns may occur in the extreme southern part of the study area. Habitat includes marshes,

swamps and bogs with tall growths of emergent vegetation. Nesting occurs in similar areas and dry fields may also be utilized if grass is tall (Palmer 1962). The nest is a flattened platform constructed of dead vegetation (Rue 1970:127).

BLACK DUCK

Anas rubripes Brewster

(Ill.-Rare)

The principal breeding range of the black duck is the eastern half of Canada south to a line from eastern Minnesota, to southeastern Wisconsin, northeastern Illinois, northern Indiana and Ohio, Pennsylvania, and south along the east coast to northeastern North Carolina. Breeding may occur along the northern end of the study area in Minnesota and Wisconsin. Wintering occurs south of a line from southeastern Minnesota to Massachusetts, and along the east coast as far north as Newfoundland (Barske 1968). The black duck is not uncommon in the study area during winter, and several high density wintering concentrations occur along the Illinois River and in southern Illinois and southeastern Missouri. It has been observed at many locations along the Mississippi and Illinois Rivers during the Annual Christmas bird counts of the National Audubon Society (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). It is considered rare in Illinois, however, on the basis of a breeding species. The black duck inhabits a variety of shallow water areas and nests dry land adjacent to woodland ponds.

Tate (1974:884) suggests that encroachment on the gene pool of the black duck by mallard (Anas platyrhynchos) genes is occurring through hybridization. Formerly, eastern woodland ponds were inhabited exclusively by black ducks, but as modern man opened up the eastern woods, such areas have become more attractive to the highly adaptable mallard, with subsequent increase of the incidence of hybridization between the two species.

PINTAIL

Anas acuta Linnaeus

(Ill.-Rare)

In North America, the pintail breeds westward from Nebraska and Minnesota to the Pacific Coast, and northward to the artic. In the study area, it is a common migrant and not uncommon as a wintering species although its main wintering range occurs south of a line from North Carolina to southern California. It is commonly observed at several locations in the study area during Christmas bird counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). The pintail is considered rare in Illinois as a breeding species. It utilizes a variety of shallow water habitats and nests in dry grassy areas adjacent to potholes, ponds or other quiet water (Kortright 1967:192).

NORTHERN SHOVELER

Anas clypeata Linnaeus

(Ill.-Rare)

The shoveler breeds from western Minnesota, Nebraska, and Oregon, to Alaska. It winters along the Pacific Coast to southward in the West, and from the Gulf Coast southward in the East. It is seen in the study area occasionally during Christmas counts (Cruickshank 1971 and 1972, Heilbrun et al. 1974) and is common as a migrant. The shoveler is considered rare as a breeding species in Illinois. It is found mainly in ponds and shallow water feeding; nests are usually located in rank grass around the boggy edges of pools (Kortright 1967: 220).

CANVASBACK

Aythya valisineria (Wilson)

(Ill.-Rare)

Canvasbacks breed in the prairie regions of the northwestern United States through west-central Canada. Wintering areas all along the coasts, although approximately 7,500 canvasbacks winter on the Mississippi River just south of the Keokuk Navigation Pool and north of Alton, Illinois (Bellrose 1968:11). Although this species will feed on animal life, they prefer aquatic plants, prompting Mills et al. (1966) to suggest that scarcity of aquatic vegetation on the Illinois River prevents greater utilization of the area by canvasbacks.

This species constructs its nest over water, in the seclusion of prairie potholes with considerable growths of emergent aquatic vegetation (Kortright 1967:246).

RUDDY DUCK

Oxyura jamaicensis (Gmelin)

(Ill.-Rare)

The ruddy duck breeds in the western and northwestern portions of the United States and in the southern portion of the prairie Provinces of Canada. It winters along the coasts and south through Mexico. Although it is seen occasionally in the winter in the study area, this diving duck is most common as a migrant (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). The ruddy duck nests in undisturbed sloughs, potholes or other areas where the emergent aquatic vegetation from which it builds its nest is plentiful. The nest is constructed over the water (Kortright 1967:368).

HOODED MERGANSER

Lophodytes cucullatus (Linnaeus)

(Ill.-Rare)

The hooded merganser breeds from the southern third of Canada to the northern third of the United States. It winters along the West coast of the United States and the Atlantic and Gulf Coasts from New Jersey to Texas. In the study area, the hooded merganser is

known both as a breeding species and also in migration. It prefers wooded lakes and streams and nests in tree cavities. The hooded merganser will accept an artificial nest box particularly if it is adjacent to the water (Morse et al. 1969).

BLACK VULTURE

Coragyps atratus (Bechstein)

(Mo.-Rare)

The black vulture is a permanent resident throughout most of its range which covers the southeastern United States from Delaware to Mexico and southward. Its breeding range extends slightly northwards however, into southeast Missouri, southern Illinois, and southern Indiana. Kleen and Bush (1971:863) reported on black-vultures nesting in southern Illinois. The black vulture is observed in a variety of habits soaring on thermals in search of carrion. It prefers to nest in a large hollow tree with an entrance hole a few feet above the ground, however, when such trees are in short supply, eggs are laid directly on the ground, sometimes under dense tangles of thickets and bushes. In some areas, the black vulture lays its eggs in shallow caves or rocky ledges (Rue 1970:48).

MISSISSIPPI KITE

Ictinia misisippiensis (Wilson)

(Mo.-Rare)

The Mississippi kite breeds from South Carolina and northern

Florida, along the Gulf to northeastern Mexico. Its breeding range extends northward to western Tennessee and Kansas, and formerly, to southern Illinois and southern Indiana. It is occasionally observed along the Mississippi River south of St. Louis where it appears to be restricted to floodplain habitat, especially areas with mature stands of timber (Terpening et al. 1974:153). George (1971:5) reported the Mississippi kite was making a comeback, presumably nesting in southern and perhaps the central part of Illinois along the Mississippi River, but depends on mature stands of timber.

SHARP-SHINNED HAWK

Accipiter striatus Vieillot

(Ill.-Rare; Mo.-Endangered)

The sharp-shinned hawk breeds in North America from the Artic to the southern tier of states in the United States. It winters mainly in the southern two-thirds of the United States and southward. The entire study area is within its breeding range and it winters from southern Minnesota southward. However, it is uncommon, seen mainly in migration (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974), and rarely as a breeder increasing in occurrence as a breeding species northward (Holt et al. 1974). It occurs in open woodlands, wood margins and hedgerows.

COOPER'S HAWK

Accipiter cooperii (Bonaparte)

(Ill.-Endangered; Mo.-Endangered; Wis.-Changing Status)

The breeding range of the cooper's hawk includes the southern fourth of Canada southward to northern Mexico, the Gulf, and central Florida. The wintering range includes most of the southern two-thirds of the United States and continues southward. Its breeding range includes the entire study area and its normal wintering range includes the entire Illinois River valley and the Mississippi River valley south of Iowa (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). The formerly common Cooper's hawk is less numerous in Wisconsin (Hine et al. 1973:12), and even more uncommon in Illinois (George 1971:5) and Missouri (Holt et al. 1974). It is an inhabitant of woodlands.

RED-SHOULDERED HAWK

Buteo linneatus (Gmelin)

(Ill.-Endangered; Mo.-Rare; Wis.-Changing Status)

The red-shouldered hawk breeds throughout the eastern half of the United States into southern Canada, a region which includes the entire study area. It can be found throughout the year south of a line from eastern Kansas through central Illinois to Massachusetts. It is an inhabitant of river bottom woods and stream straightening, impoundments and water pollution, as well as pesticides threaten its

existence (Hine et al. 1974:12). In a study in Maryland, Stewart (1949) reported red-shouldered hawk nests in 14 different species of trees, all deciduous, ranging 1-4 ft. D.B.H. and averaging about 2 ft. Nests were found from 28 to 77 ft. above the ground, averaging about 50 ft. Henny et al. (1973) studying an adjacent area also found nests in fourteen species of trees, twelve were decidous; two were pines (Pinus spp.). Nest heights in the latter study ranged from 42 to 72 ft. with the mean being 53.5 ft. Henny et al. (1973) concluded that under optimum conditions of habitat and breeding density, recruitment was adequate to negate the possible deletarious effects to reproductive performance of low level pesticide concentrations in red-shouldered hawk eggs.

SOUTHERN BALD EAGLE

Haliaeetus leucocephalus leucocephalus (Linnaeus)

(U.S.-Endangered; Mo.-Extirpated)

NORTHERN BALD EAGLE

H. l. alascensis Townsend

(Ill.-Endangered; Mo.-Rare; Wis.-Endangered)

The southern bald eagle winters in its breeding range and wanders northward over the southern three-fourths of the continental United States south of Canada. The northern bald eagle winters in its breeding range of Canada, excluding the northernmost regions, the northern fourth of the continental United States, Alaska, and it also

migrates along major bodies of water. In Missouri, the northern bald eagle winters in fair numbers, however, Holt et al. (1974) considered the souther bald eagle, which formerly nested in the state, extirpated. In Illinois, distribution of this species is primarily restricted to the floodplains of the Mississippi River and other large rivers (Graber and Golden 1960:22). It is observed in the winter at many localities in the study area along both the Mississippi River and Illinois River (Shaw 1965, Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun 1974). Hine et al. (1973:8) reports that the bald eagle has declined as a result of insecticides, encroachment on nesting areas and illegal shooting.

MARSH HAWK

Circus cyaneus (Linnaeus)

(Ill.-Rare; Wis.-Changing Status)

The breeding range of the marsh hawk includes the southern two-thirds of Canada and Alaska, southward into the northern half of the remainder of the continental United States. Its wintering range includes the southern three-fourths of the United States south of Canada into Mexico. Graber and Golden (1960:23) reported the marsh hawk the third most frequently encountered raptor in Illinois Christmas bird counts from 1903 to 1955 with no indications of radical change in the population. Hine et al. (1973:12) described it as formerly one of the commonest hawks in Wisconsin marshy or prairie areas until

a drastic decrease from 1960 to 1968. Although the marsh hawk now is recorded as common in some parts of Wisconsin, there are reports also that the breeding populations in some areas including many parts of central Wisconsin and in the southern third of the state are down (Hine et al. 1973:12).

OSPREY

Pandion haliaetus carolinensis (Gmelin)

(U.S.-Status Undetermined; Ill.-Endangered; Mo.-Endangered; Wis.-Endangered)

The osprey breeds from the arctic to southern Canada and the Pacific northwest. It winters from central California and Florida southward. It is an uncommon migrant in the study area. Although the osprey is piscivorous, its distribution is not limited to the floodplain (Terpening et al. 1974:168). Regarding a recent drastic decline in the breeding population in Wisconsin, Hine et al. (1974:8) state: "Loss of habitat, direct human disturbances and predation cannot account for the widespread nest failures and reduced productivity. The most likely cause is reproductive failure due to environmental pollutants such as DDT."

PEREGRINE FALCON

Falco peregrinus anatum (Bonaparte)

(U.S.-Endangered; Ill.-Endangered; Mo.-Endangered; Wis.-Extirpated)

Falco peregrinus anatum is extirpated as a breeding species

east of the Rocky Mountains in the United States, in Ontario, southern Quebec and the maritimes (OESIA 1973:127). Some birds remain in the non-Arctic regions of Alaska and Canada south to Baja Mexico, locally in the western United States, with some local distribution in the southern boreal forests of Canada and in Labrador. Wintering occurs chiefly in the breeding areas but some migration occurs, particularly from the northern regions. Hine et al. (1973:20) report that between 1940 and 1950, thirteen breeding sites still occurred in Wisconsin along the Mississippi and Wisconsin Rivers, however, the last breeding adult was seen in 1964. F. p. tundrius still passes through Wisconsin and probably the rest of the study area but it too has "Endangered" status nationally (OESIA 1973:129). Chlorinated hydrocarbon insecticides have led to persisting widespread reproductive failures and extirpation over wide regions in both Europe and North America since the late 1940's (Hine et al. 1973:20).

BOBWHITE

Colinus virginianus (Linnaeus)

(Wis.-Changing Status)

The bobwhite is a permanent resident of hedgerows and brushy edges in agricultural lands throughout most of the eastern United States. The northern end of its range extends across central Wisconsin and southern Minnesota. Bobwhites have steadily declined in numbers in this region until there are only scattered populations in central and

western Wisconsin at the present time. The decline has been directly correlated with the destruction of shrubby hedgerow cover along fields, woodlands, streams and roadsides (Hine et al. 1973). In Illinois bobwhite populations tended to increase from north to south (Graber and Graber 1963:466).

KING RAIL

Rallus elegans Audubon

(Mo.-Rare)

The breeding range of the king rail included the entire United States east of central North Dakota, Nebraska and Texas. It winters along the Atlantic and Gulf Coasts from Maryland to Texas, including all of Florida and the lower Mississippi River valley. Cooke (1914) reported it breeding as far north in the study area as a line between Madison, Wisconsin, and Faribault, Minnesota. Formerly statewide in its distribution in Missouri, the king rail is becoming increasingly rare because of the destruction of marsh environments through drainage and channelization programs (Holt et al. 1974).

YELLOW RAIL

Coturnicops noveboracensis (Gmelin)

(Ill.-Probably Extirpated)

Present breeding ranges of the yellow rail appears to be mainly in central and south-central Canada. Migration carries yellow

rails through most of the United States to wintering areas along the coasts from North Carolina to Texas, and in California (Robbins et al. 1966:102). Cooke (1914) reported breeding records for the Chicago-northern Illinois-southeastern Wisconsin area and presumed from summer sighting records, that it formerly nested over the entirety of the present study area. George (1971:5) suggested that a few lingering remnants of former rare breeding populations in Illinois might be revealed by a careful combing of suitable habitats (lush grassy places near clear lagoons) if any such habitats still exist.

BLACK RAIL

Laterallus jamaicens (Gmelin)

(Ill.-Probably Extirpated; Mo.-Status Unknown)

The breeding range of the black rail extends from the lower Great Lakes region through Illinois and southern Wisconsin to Kansas, and along the East Coast from Massachusetts to Florida. Wintering areas are along the coasts from South Carolina to Texas and northern California to northern Baja Mexico. Former breeding range in the study area presumed from Cooke's (1914:34) records included all of the area along the Illinois River, and that part of the Mississippi from St. Louis, Missouri, to Dubuque, Iowa. Holt et al. (1974) believed the black rail nested in Missouri but added that little was known of its status. George (1971:5) suggested that combing suitable marsh habitats might reveal a few nesting birds in Illinois, however,

he expressed doubt that such habitats still existed.

COMMON SNIPE

Capella gallinago (Linnaeus)

(Ill.-Rare)

The common snipe breeds from Newfoundland and northern Manitoba south to northwestern Pennsylvania, northern Illinois, and South Dakota; it winters from the Gulf of Mexico sparingly to the northern states (Peterson 1947:65). In the study area, it is common in migration and it has been observed at various locations during Christmas counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). It is considered rare in Illinois as a breeding species. Its preferred habitat is open boggy margins of little streams and marshes (Peterson 1947:65).

UPLAND SANDPIPER

Bartramia longicauda (Bechstein)

(Ill.-Endangered; Mo.-Endangered; Wis.-Changing Status)

The upland sandpiper breeds from Maine to western Nebraska northward through Canada to Alaska. It migrates through the eastern half of the United States wintering in south America. Ridgway (1895) reported that in Illinois the upland sandpiper was "as familiar a bird as the prairie chicken or meadowlark." It was a "very common summer resident" found in greatest abundance along the "borders of marshes

and half wild prairies." Graber and Graber (1963) noted that a decline in the state population and a shift of the population toward central Illinois were related to habitat changes during the last fifty years. A primary factor in the decline was a great loss of acreage in pastureland as well as a decrease in quality of the remaining pastures as sandpiper habitat. Drainage of wet prairies and pastures and overpasturing are the chief sources of trouble for the upland sandpiper (Hine et al. 1973:14).

WILSON'S PHALAROPE

Steganopus tricolor Vieillot

(Ill.-Probably Extirpated)

Wilson's phalarope breeds primarily in the northern half of the western United States and the south portion of the Prairie Provinces in Canada. It migrates southward through Mexico. Nesting on prairie ponds and sloughs, George (1971:5) reported that Wilson's phalarope was a summer resident in Illinois on the decline resulting from destruction of habitat.

FORSTER'S TERN

Sterna forsteri Nuttall

(Ill.-Rare)

Forster's tern breeds in salt marshes along the coast from Maryland to Texas and in western prairie marshes in southern Canada

eastward to Minnesota and northeastern Illinois. It winters along the coasts southward from California and from South Carolina (Peterson 1947:86). Bergman et al. (1970) found Forster's terns nesting in large densely vegetated marshes in Iowa, building nests somewhat above water level, usually on substrates, such as large muskrat houses, in or at the edge of open pools of water. It is considered rare as a breeding species in Illinois.

COMMON TERN

Sterna hirundo Linnaeus

(Ill.-Rare)

The common tern breeds locally on sandy beaches and small islands from the Gulf of St. Lawrence and northern Manitoba southward to the Great Lakes and Gulf of Mexico. It winters from Florida south along the coasts (Peterson 1947:86). It is considered rare as a breeding species in Illinois.

LEAST TERN

Sterna albifrons Pallas

(Ill.-Rare; Mo.-Rare)

The least tern breeds on the coast from Texas to Massachusetts and also along the major inland rivers north to Iowa, Ohio, southwest Kansas, and Nebraska; it winters from Louisiana southward (Peterson 1947:88). The least tern requires sandy beach for nesting. Brewer

(1954) reported two breeding areas with similar characteristics of large sandy beaches, one on an Ohio River sandbar, where the colony occupied an area about 50 by 100 yards in dimension, the other on the Mississippi River, Mosenthein Island, opposite north St. Louis, having a sand beach 50 to 100 yards wide. Hardy (1957) cited three factors influencing occurrence and breeding of the least tern in the Mississippi River Valley: (1) they nest on sandbars which are variable entities, (2) water levels must be favorable during the nesting season, and (3) shallow water must be available for foraging. Hardy (1957) considered channelization and building of dams, revetments, dikes and pilings as detrimental to sandbar formation and, consequently, to nesting of least terns. Nesting habitat was located on many islands on the Mississippi River below Grafton, Illinois, but human disturbance has eliminated much of it (personal communication, M. J. Sweet, Cooperative Wildlife Research Laboratory, Southern Illinois University at Carbondale).

BARN OWL

Tyto alba (Scopoli)

(Ill.-Rare; Mo.-Rare; Wis.-Changing Status)

The barn owl is a permanent resident in its range which extends from Massachusetts to Ohio, southern Wisconsin, and Nebraska, south to the Gulf of Mexico, into Mexico southward, and along the West Coast

to British Columbia. Holt et al. (1974) considered barn owls permanent residents throughout Missouri but uncommon. Hine et al. (1974:14) reported the species on the northern edge of its range and uncommon, but consistently observed in the southern part of Wisconsin. They added that records have diminished in the last five years. As suggested by its name, the barn owl is "partial to old buildings, barns, towers" (Peterson 1947:96).

LONG-EARED OWL

Asio otus (Linnaeus)

(Ill.-Rare)

The long-eared owl breeds in an area from New Jersey to southern California north to the Northwest Territories and New Brunswick. It winters from Maine, Saskatchewan and Washington, south to northern Mexico, northern Texas and North Carolina. Ridgway (1889) considered its favorite haunts dense willow thickets which occur commonly in the study area but these are subject to periodic inundation if located in the unprotected floodplain. The long-eared owl is occasionally observed in the study area during Christmas counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974).

SHORT-EARED OWL

Asio flammeus (Pontoppidan)

(Ill.-Rare)

The short-eared owl breeds from Maine to northern California northward to the Arctic. It winters from Maine to Washington southward through Mexico. Peterson (1947:99) describes this species as a day-flying ground owl of marshes and open country. The nest is a slight depression in the ground lined with a few weeds and feathers (Rue 1970:204). On Christmas counts, the short-eared owl is usually observed in the study area but not at many stations or in great numbers (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). Graber and Golden (1960) report decreasing numbers of observations from north to south in Illinois.

SAW-WHET OWL

Aegolius acadicus (Gmelin)

(Ill.-Rare)

The saw-whet owl breeds in the northern third of the United States, excluding Alaska, and the southern thirds of Canada. It winters in the breeding range and somewhat farther south to California and northern Mexico but not to the Gulf. George (1969:12) reported this owl as unrecorded for southern Illinois but known as a breeding species in central Illinois. It is nocturnal and seldom seen unless

found roosting in dense young evergreens or in thickets (Robbins et al. 1966:164).

YELLOW-BELLIED SAPSUCKER

Sphyrapicus varius (Linnaeus)

(Ill.-Rare)

The yellow-bellied sapsucker breeds from Cape Brenton Island, southern Quebec, and Manitoba south to New England, northern Ohio, Indiana and Missouri, in the mountains of the east to North Carolina, and in the mountains of the west through Mexico and California. It winters from New Jersey to Iowa, Texas, Arizona and Oregon southward through Mexico. It is a retiring species found in woods and Orchards (Robbins et al. 1966:184). The yellow-bellied sapsucker is commonly seen at many localities in the study area during Christmas counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heibrun et al. 1974). It is considered rare in Illinois as a breeding species.

FISH CROW

Corvus ossifragus Wilson

(Mo.-Rare)

The fish crow is a permanent resident along the coast from Massachusetts to Texas. It is extending in range up the Mississippi Valley and has been reported a possible breeding species as far north as St. Louis (Terpening et al. 1974:159). They continue, "Although

fish and common crows [Corvus brachyrhynchos] are sympatric geographically and ecologically, the fish crow is less dependent upon agricultural land, and apparently becomes dominant when cultivated land is abandoned. In addition, the fish crow nests at a higher level than the common crow, and later in the season, thus avoiding the period of annual flooding." The fish crow is generally considered a scavenger along shores and it is considered closely associated with the floodplain in the study area below St. Louis.

RED-BREASTED NUTHATCH

Sitta canadensis Linnaeus

(Ill.-Rare)

The red-breasted nuthatch breeds from the limit of spruce trees in Canada south to northern Minnesota, Michigan and northern New England. It breeds throughout the western mountain regions and in the East along the Appalachians and winters through most of the continental United States excluding Alaska. The red-breasted nuthatch is considered rare as a nesting species in Illinois, known from locations in the northern part of the state (George 1971:6). It is commonly observed in the study area during Christmas bird counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). The red-breasted nuthatch prefers areas of conifers.

BROWN CREEPER

Certhia familiaris Linnaeus

(Ill.-Rare)

Found in woodlands, the brown creeper breeds from southern Quebec, central Ontario, and southern Manitoba, south to the northern parts of the United States, in the mountains of the East to North Carolina, and in the mountains of the West to Mexico. It winters in the southern three-fourths of the United States and into Mexico. In the study area, the brown creeper is not uncommon during Christmas counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun et al. 1974). It was previously believed that this species was not a summer resident in Illinois (George 1969:12), however, it is now known to breed in the state (Greer 1966). Kendeigh (1970) summarized a series of sightings, several in the study area, including observations from Horseshoe Lake State Game Refuge near Olive Branch, Illinois, and from Mark Twain National Wildlife Refuge near Kiethsburg, Illinois. George (1972) suggested that the brown creeper in Illinois may be expanding its range southward participating in a phenomenon which apparently is occurring in the eastern mountains presently. There is also the possibility that the brown creeper in Illinois represents and undescribed form, physiologically and perhaps even morphologically distinct from the coniferous forest breeding populations north of Illinois (George 1971:6). Although the usual habitat of the brown

creeper is coniferous forests, in Illinois and Missouri, the bird has been recorded almost entirely from floodplain cypress-tupelo and deciduous forest (Terpening et al. 1974:161).

BEWICK'S WREN

Thryomanes bewickii (Audubon)

(Ill.-Rare; Wis.-Changing Status)

Bewick's wren breeds and winters over much of the southern half of the continental United States. In the study area its breeding range extends from southern Minnesota southward, and its wintering range extends from central Illinois southward. Bewick's wren inhabits farmyards, brush and fencerows (Robbins et al. 1966:222). An individual was observed in the 1971 Christmas count originating in Elsah, Illinois (Cruickshank 1972), and another was observed near Pike County Conservation Area, Illinois, on 13 August 1974 (personal communication, M. J. Sweet, Cooperative Wildlife Research Laboratory, Southern Illinois University at Carbondale).

LOGGERHEAD SHRIKE

Lanius ludovicianus Linnaeus

(Ill.-Rare; Wis.-Changing Status)

The breeding range of the loggerhead shrike includes most of the continental United States excluding Alaska, and the southern fourth of Canada, extending into Mexico. The wintering range is

found south of a line from northern New Jersey to northern California, into Mexico. Formerly common in Wisconsin, it is now very uncommon and decreasing. Also the eggs show pesticide residues (Hine et al. 1973:15). Graber et al. (1973:7) considered the loggerhead shrike largely extirpated as a breeding species in Illinois north of a line from Crawford to Pike Counties. Both reduction of hedgerows used for nesting, and reduction of acreage in hayfields used for foraging, may have operated in the decline of the loggerhead shrike in Illinois since 1957 (Graber et al. 1973:7). It has been recorded from several points in the study area during Christmas Counts (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun 1974).

SWAINSON'S WARBLER

Limnothlypis swainsonii (Audubon)

(Ill.-Rare; Mo.-Rare)

The Swainson's warbler breeds in wooded swamps where there is a growth of cane (Arundinaria gigantea) from southeastern Maryland, southern Virginia, southern Indiana, southern Illinois, southeastern Missouri and northeastern Oklahoma, south to Louisiana and Florida. It is also found locally in rhododendron-hemlock tangles in the central Alleghenies. It winters in Jamaica and Yucatan (Peterson 1947: 137). Reports of Swainson's warbler in southern Illinois have been associated with the typical habitat: stands of cane with large shade producing trees (George 1969, 1971, 1972).

PINE WARBLER

Dendroica pinus

(Ill.-Rare)

The pine warbler breeds in the eastern half of the continental United States and the southern fourth of eastern Canada. It winters from Delaware, North Carolina and eastern Oklahoma, southward to Florida and through eastern Mexico. The western portion of the breeding range includes the study area. This warbler breeds in mature pines and is found also in orchards and other deciduous trees during migration (Robbins et al. 1966:268).

YELLOW-HEADED BLACKBIRD

Xanthocephalus xanthocephalus (Bonaparte)

(Mo.-Rare)

The yellow-headed blackbird breeds in most of the western United States and in the central Prairie Provinces of Canada as far east as northern Illinois and Wisconsin. It is locally abundant in cattail and tule marshes (Robbins et al. 1966:280). Peterson (1970: 691) reported three successive summers of nesting yellow-headed blackbirds at East Moline, Illinois.

BREWER'S BLACKBIRD

Euphagus cyanocephalus (Wagler)

(Ill.-Rare)

Brewer's blackbird breeds in the northwestern United States

and south-central Canada as far east as Wisconsin. It winters in the southwestern United States and Mexico, ranging from the Pacific northwest to Louisiana, southward. Occasionally it is observed during Christmas counts on the study area (Cruickshank 1971 and 1972, Arbib et al. 1973, Heilbrun 1974). Brewer's blackbird inhabits grassy prairies and meadows and can be found around farms, fields and roadsides (Peterson 1947:159, Robbins et al. 1966:280).

LE CONTE'S SPARROW

Ammospiza leconteii (Audubon)

(Ill.-Probably Extirpated)

Le Conte's sparrow breeds in prairie marshes from Great Slave Lake southeastward to North Dakota, southern Minnesota and Wisconsin. It migrates southeastward to South Carolina, central Florida, Louisiana and Texas (Peterson 1947:171). George (1971) suggested a few birds may still nest in northeastern Illinois, but this is unlikely due to habitat destruction. A Le Conte's sparrow was observed during the Christmas count originating from Pere Marquette State Park, Illinois, in 1973 (Heilbrun et al. 1974). Another was seen near Goose Lake, Jefferson, Iowa, on 26 December 1969 (Peterson 1970:510). Le Conte's sparrow occurs in tall marsh grass in summer and dry fields in the winter (Robbins et al. 1966:310).

HENSLOW'S SPARROW

Ammodramus henslowii (Audubon)

(Mo.-Rare)

Henslow's sparrow breeds mainly in the northeastern United States from southern New Hampshire, New York, southern Ontario, and South Dakota south to North Carolina, West Virginia and northern Texas; it winters in the southeastern United States (Peterson 1947: 171). This species is rare and local in distribution, occurring in broomsedge fields and virgin tall grass prairies (Robbins et al. 1966:308, Holt et al. 1974).

BACHMAN'S SPARROW

Aimophila aestivalis (Lichtenstein)

(Ill.-Endangered; Mo.-Endangered)

Bachman's sparrow breeds from northeastern Illinois to Maryland, south to eastern Texas and central Florida. Wintering range includes the coastal states from North Carolina to eastern Texas. Uncommon and local in its distribution, Bachman's sparrow inhabits abandoned fields with scattered shrubs, pines, or oaks, usually in dense ground cover (Robbins et al. 1966:316).

CLAY-COLORED SPARROW

Spizella pallida (Swainson)

(Ill.-Probably Extirpated)

The clay-colored sparrow breeds from central Wisconsin to

Nebraska, northwest to Great Slave Lake. It breeds in brushy country such as prairies, pine barrens and openenings (Peterson 1947: 176). Regarding the clay-colored sparrow in Illinois, George (1971:7) commented, "It is doubtful if more than a handful of these sparrows ever nested in Illinois and the species in all probability is gone now."

MAMMALS

The species considered in this section were selected from OESIA (1973), INPC (1971), Holt et al. (1974) and Hine et al. (1973). Unless otherwise referenced, information on nomenclature, distribution, range and ecological requirements was taken from Burt and Grossenheider (1964), Hoffmeister and Mohr (1957) and Schwartz and Schwartz (1959).

SOUTHEASTERN SHREW

Sorex longirostris Bachman

(Ill.-Rare; Mo.-Rare)

The southeastern shrew ranges from northern Arkansas north to eastern Illinois eastward to the Atlantic Coast from Virginia to northern Florida. In Illinois it is known only in Union, Alexander, Coles, Fayette, Johnson and Pope Counties and its range may fringe southeastern Missouri (Hoffmeister and Mohr 1957:59, Kimstra and Roseberry 1969:413). Not confined to one kind of habitat, the southeastern shrew prefers moist areas and is found in open fields and woodlots (Burt and Grossenheider 1964:6).

PIGMY SHREW

Microsorex hoyi (Baird)

(Ill.-Rare)

The range of the pygmy shrew includes most of Canada and Alaska except the West Coast, extending into the United States as far as northern Illinois, eastern Ohio, and down the Appalachians to North Carolina (Hoffmeister and Mohr 1957:58). In Illinois, it is known from only one location in Cook County (Sanborn and Tibbitts 1949). Besides Cook County, Illinois, the presumed range in the study area also extends from northeastern Iowa northward (Cory 1912:420). The pygmy shrew inhabits woodlands, thickets and grassy clearings, wet or dry (Burt and Grossenheider 1964:12).

SOUTHEASTERN BAT

Myotis austroriparius (Rhoades)

(Ill.-Rare)

The southeastern bat ranges along the Gulf Coast from northern Florida to Louisiana, northeastern Texas and southeastern Oklahoma, and up the Mississippi River valley to southern Illinois and Indiana (Burt and Grossenheider 1964:28). In Illinois, it is known only from caves and mines in Alexander and Hardin Counties where it was hibernating; it has not been found in the summer (Hoffmeister and Mohr 1957:71). Caves are the favored roosts, but the southeastern bat has also been found in hollow trees, crevices between bridge timbers, storm sewers, culverts, the vertical drain pipes of concrete bridges and in various types of buildings (Barbour and David 1969:60).

GRAY BAT

Myotis grisescens Howell

(Ill.-Rare; Mo.-Endangered)

The range of the gray bat extends from eastern Kentucky and Tennessee to western Missouri and northeastern Oklahoma, with an extension in the east to northwestern Florida. In Illinois, it is known only from Pike and Hardin Counties, but it likely occurs throughout the southern half of the state (Hoffmeister and Mohr 1957:72). Found in all but the northern part of Missouri, it is the only bat that can be found in the caves of the state all year (Schwartz and Schwartz 1959:54). Barbour and Davis (1969:64) state the species is almost unknown outside of caves, even unknown from mines. However, a maternity colony of ca. 15,000 gray bats was found in an abandoned barn in central Missouri in 1967 by Gunier and Elder (1971). Using caves for both roosting and bearing young, gray bats are found in compact clusters, hanging from the ceilings (Burt and Grossenheider 1964:28-29).

KEEN'S BAT

Myotis keenii (Merriam)

(Mo.-Rare)

The range of the Keen's bat is discontinuous, one population occurring in an area extending from Newfoundland to western North Dakota and southward to central Arkansas and western Florida, and

another population occurring in western British Columbia and western Washington (Hoffmeister and Mohr 1957:73). Presumably, the gray bat occurs over the entire study area, but records are few (Layne 1958, Pearson 1962). Apparently a solitary species, it utilizes mine tunnels, caves, buildings, hollow trees, storm sewers and forested areas (Barbour and Davis 1969:76, Burt and Grossenheider 1964:29).

INDIANA BAT

Myotis sodalis Miller and Allen

(U.S.-Endangered; Ill.-Endangered; Mo.-Endangered)

The range of the Indiana bat extends from eastern Oklahoma to northeastern Iowa and southwestern Wisconsin, east to Vermont, and south to northwestern Florida. It occurs in most of Missouri except the northwestern part (Schwartz and Schwartz 1959:59). It probably occurs in most of Illinois although it has been taken only in Union, Hardin, LaSalle and Jo Daviess Counties (Hoffmeister and Mohr 1957: 74, Layne 1958:226, Pearson 1962). Walley (1970) reports the Illinois River is a migration route of the Indiana bat. Barbour and Davis (1969:88-89) state: "Myotis sodalis is known primarily from the caves in which it hibernates. In winter it congregates by thousands in tightly-packed clusters in the relatively few caves and mines which it finds suitable to its needs. Two caves in Kentucky and a cave and a mine in Missouri each harbor about 100,000 in winter, accounting for about 90 percent of the known population of this

species; the rest occur in groups of from a dozen to a few thousand in several dozen caves and mines."

SMALL-FOOTED MYOTIS

Myotis leibii (Audubon and Bachman)

(Mo.-Endangered)

The small-footed myotis is also known as the "least bat," Myotis subulatus. Its range is extensive in the East and the West and two authorities (Burt and Grossenheider 1964:34, Schwartz and Schwartz 1959:60) extend the presumed range through the Mid-west to include most of Illinois, Iowa and Missouri. However, Hoffmeister and Mohr (1959:74) state that it has not been reported in Illinois. Barbour and Davis (1969:103) explain the only Missouri specimen was obtained from beneath a stone on a hillside by P. W. Smith while he was hunting snakes in the southeastern part of the state twenty years ago. If Myotis leibii does occur in the study area, it would probably be found between Cairo and Grafton along the Mississippi River or along the lower Illinois River. The small-footed myotis uses caves, mine tunnels, crevices in rocks and buildings in or near forested areas (Burt and Grossenheider 1964:33).

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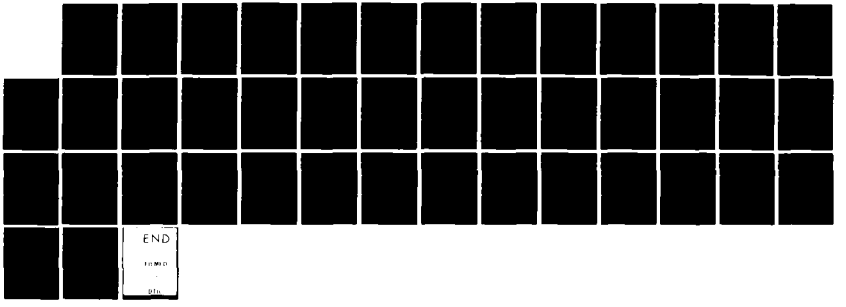

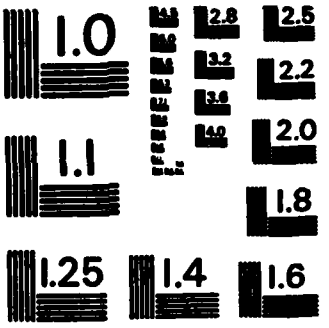

WESTERN BIG-EARED BAT

Plecotus townsendii Cooper

(Mo.-Endangered)

OZARK BIG-EARED BAT

P. t. ingens (Handley)

(U.S.-Threatened)

VIRGINIA BIG-EARED BAT

P. t. virginianus (Handley)

(U.S.-Threatened)

The western big-eared bat was formerly known as the "western lump-nosed bat," Corynorhinus rafinesquei. It is primarily a western species, occurring from Wyoming to Texas and westward to California and British Columbia. Disjunct colonies occur eastward as far as western Virginia. Barbour and Davis (1969:173) consider these eastern extensions, isolated colonies. Using this criterion, the species does not occur in the study area. Burt and Grossenheider (1964:43) and Schwartz and Schwartz (1959), however, presumed the range to be continuous. Using this criterion, the western big-eared bat might occur in the study area, roughly from Cairo to Grafton along the Mississippi River, and along the lower Illinois River. The known colonies nearest the study area are in southwestern Missouri and eastern Kentucky. The former is inhabited by the subspecies, P. t. ingens, the Ozark big-eared bat. The latter is inhabited by the

subspecies, P. t. virginianus, the Virginia big-eared bat. Both subspecies are considered "threatened" on a national level (OESIA 1973: 211-213). In the eastern part of its range, this species is usually associated with caves, cliffs and rock ledges in well drained oak-hickory forests (Barbour and David 1969:165).

EASTERN BIG-EARED BAT

Plecotus rafinesquii (Le Conte)

(Ill.-Rare; Mo.-Endangered)

The eastern big-eared bat was formerly known as the "eastern lump-nosed bat," Corynorhinus macrotis. The range of this bat extends from Louisiana along the Mississippi and Ohio Rivers to southern Indiana, eastward to southern Virginia and south to the Gulf (Barbour and Davis 1969:180, Burt and Grossenheider 1964:44, Schwartz and Schwartz 1959:86). In the study area, it is known from Union and Alexander Counties, Illinois, and possibly from southeastern Missouri (Hoffmeister and Mohr 1957:85, Layne 1958:232, Pearson 1962). The eastern big eared bat is found in caves, mine tunnels and buildings and tends to choose more open and lighted day roosts than other bats.

BLACK BEAR

Euarctos ursus americanus Pallas

(Mo.-Endangered)

The black bear occurs throughout most of Canada to northern Minnesota and Wisconsin, southward along the Appalachian Mountains to

northern Georgia in the East, southward along the Rocky Mountains to northern Mexico and southward down the Sierra's to central California in the West. This bear is also found in the wilder areas of the Gulf Coast from Florida to Louisiana, and in the Ozarks of Arkansas and southern Missouri. Rarely reported in the study area, Klimstra and Roseberry (1969:415) suggest such sightings represent "invaders" from nearby occupied states or animals released or escaped from captivity. The black bear lives in heavily wooded areas and uses a hollow tree, cave, sheltered place under tree roots or a slightly excavated hollow in the ground for a winter den (Schwartz and Schwartz 1959:269).

LEAST WEASEL

Mustela nivalis Linnaeus

(Mo.-Rare)

The least weasel is also known as Mustela rixosa (Bangs). Its range includes most of Canada extending southward to a line from southern Nebraska to southern Ohio and southward along the Appalachians to northern Georgia (Burt and Grossenheider 1964:60-61). It may occur along the upper Illinois River and from northernmost Missouri northward along the Mississippi River. Its habitat consists of meadows, fields, brushy areas and open woods.

LONG-TAILED WEASEL

Mustela frenata Lichtenstein

(Mo.-Rare)

The long-tailed weasel occurs in most of the continental United States, southern Canada and northern Mexico, including the entire study area (Burt and Grossenheider 1964:63). This weasel lives in a variety of habitats including under haystacks, brush piles and farm buildings, but it prefers woodlands, thickets and brushy fencerows near available drinking water (Hoffmeister and Mohr, 1957:100, Schwartz and Schwartz 1959:281).

RIVER OTTER

Lutra canadensis (Schreber)

(Ill.-Rare; Mo.-Endangered)

The range of the river otter covers most of the United States and Canada although it was never abundant. In recent years it has disappeared from large sections of its range and is generally rare where it occurs (Schwartz and Schwartz 1959:308). Some otters still occur in Missouri and twenty-five have been seen or taken in Illinois since 1900 (Hoffmeister and Mohr 1957:106). Records dating since 1912 and as late as 1936 exist for the Illinois counties of Alexander, Union, Jackson, Monroe and Calhoun bordering the Mississippi River, and for Morgan, Cass, Fulton, Woodford, Marshall and Bureau along the Illinois (Mohr 1943:528). In 1934 and 1935, respectively, otters were

reported along the Mississippi River and backwaters in Lincoln and Mississippi Counties, Missouri (Bennit and Nagel 1937:136). The otter is a semi-aquatic mammal found in streams, lakes and rivers which are usually but not always bordered by forest.

BOBCAT

Lynx rufus (Schreber)

(Ill.-Endangered; Wis.-Changing Status)

The range of the bobcat includes western North America from southern Canada to central Mexico, across the northern United States and southern Canada to Nova Scotia and the lower Appalachians, and across the southern United States to southern South Carolina. The bobcat has been reported recently for Alexander and Union Counties, Illinois and probably occurs elsewhere in the study area (Layne 1958, Klimstra and Roseberry 1969). It prefers wooded sections along rivers, especially timbered bluffs and slopes that are interspersed with sunny glades and swampy bottomlands (Hoffmeister and Mohr 1957:121-123, Burt and Grossenheider 1964:85).

RED SQUIRREL

Tamiasciurus hudsonicus (Erxleben)

(Ill.-Probably Extirpated)

The red squirrel occurs throughout most of Canada and Alaska, in the mountainous areas of the western United States as far south as

southeastern Arizona, and in the eastern United States as far south as southern Iowa, central Indiana, and western North Carolina. In the study area its range extends from southern Iowa northward along the Mississippi. Although it is probably extirpated from Illinois, one authentic record of this species came from Hennepin, Putnam County, located on the upper Illinois River (Hoffmeister and Mohr 1957:143). The red squirrel utilizes forests or swamps with pine and spruce or mixed hardwoods.

PLAINS POCKET GOPHER

Geomys bursarius (Shaw)

(Ill.-Rare)

The range of the plains pocket gopher covers an irregular area, mainly west of the Mississippi River, from southern Manitoba to central Texas. Its presumed range along the Mississippi River extends from above the northern end of the study area southward to Randolf County, Illinois (Howell 1910:31). Along the Mississippi River, it is also known from Monroe and St. Clair Counties, Illinois (Mohr 1943), and St. Louis County, Missouri (Klimstra and Roseberry 1969, McLaughlin 1958). East and south of the middle Illinois River, it occurs in sandy and black soils (Hoffmeister and Mohr 1964:153). The plains pocket gopher inhabits grassland, alfalfa fields, pastures, roadsides and railroad rights-of-way.

COTTON MOUSE

Peromyscus gossypinus Le Conte

(Ill.-Endangered).

The range of the cotton mouse is an irregular area including most of the southeastern states with northward extensions into northeastern Virginia and southern Illinois and westward limits to eastern Texas and Oklahoma. Howell (1910:26) reported it in Alexander County, Illinois, and Schwartz and Schwartz (1959:188) reported it in the Mississippi Lowland in southeastern Missouri. The cotton mouse inhabits moist, timbered areas, especially swamps and river bottoms, living in dense underbrush.

GOLDEN MOUSE

Ochrotomys nuttalli aureolus (Audubon and Bachman)

(Ill.-Rare)

The range of the golden mouse extends from southern Virginia west to southern Missouri and Oklahoma, and southward to the Gulf Coast and to central Florida. In the study area, it is known from the Mississippi Lowlands of southeastern Missouri (Schwartz and Schwartz 1959:191) and Alexander, Union, and Jackson Counties, Illinois (Layne 1958, Blus 1966, Klimstra 1969). Klimstra and Roseberry (1969:416) suggest the golden mouse may be more widely distributed than generally appreciated. Concerning habitat, they state, "Almost without exception the recent occurrences of this mouse reflect the presence of

catbriar (Smilax spp.) or grape vine (Vitus spp.) entanglements in trees or stands of cane (Arundinaria gigantea) either along narrow, upland waterways, or as found in floodplains of major streams."

RICE RAT

Oryzomys palustris (Harlan)

(Ill.-Rare)

The range of the rice rat includes an area extending from southern New Jersey westward to northwestern Arkansas and southward to extreme northeastern Mexico and Florida with an extension into southeastern Kansas. In the study area, it is known from the Mississippi Lowland in southeastern Missouri (Schwartz and Schwartz 1959:172) and from Alexander, Union, and Jackson Counties, Illinois (Klimstra and Scott 1956:3). The rice rat prefers marshes and wet meadows with an abundance of dense ground cover although some upland slopes with tall grass, weeds or brush are inhabited.

EASTERN WOODRAT

Neotoma floridana illinoensis Howell

(Ill.-Endangered)

The eastern woodrat occurs throughout much of the southeastern quarter of the United States. In the study area it is known only from Union and Jackson Counties, Illinois along the Mississippi River (Howell 1910, Swayne 1949, Layne 1958, Crim 1961, Klimstra 1969, Nawrot 1974), and may also exist on the

Missouri side of the river (Schwartz and Schwartz 19 9:199). The approximately 50 individuals found by Nawrot (1974) n his recent study of the remaining Illinois woodrat population, 11 occurred along the limestone bluffs at Pine Hills in Union Co nty, and at Fountain Bluff in Jackson County, which border r are contained within the Mississippi River floodplain. Woodrats inhabit rocky wooded areas, and to a lesser extent, swampy or open lands.

WHITE-TAILED JACKRABBIT

Lepus townsendii Bachman

(Ill.-Endangered; Mo.-Endangered; Wis.-Changing Status)

The range of the white-tailed jackrabbit extends from northwestern Illinois and most of Wisconsin, westward to central Saskatchewan and central Oregon, and south to east-central California and northern New Mexico. In the study area, it is known from the sand prairie at Savanah, Jo Daviess County, Illinois, northward (Hoffmeister and Mohr 1957:193). The white-tailed jackrabbit prefers a grassland habitat and lives in prairies or grassy openings of forested slopes.

SWAMP RABBIT

Sylvilagus aquaticus (Bachman)

(Mo.-Rare)

The range of the swamp rabbit extends from northwestern South Carolina to eastern Texas and includes two narrow northward projections,

one into southern Illinois and southeastern Indiana and the other into southeastern Kansas (Hoffmeister and Mohr 1957:196). In the study area, it is known from the Mississippi Lowland in southeast Missouri and specimens have been obtained from Alexander, Union, Jackson and Calhoun Counties, Illinois; it may occur as far north as Quincy (Klimstra and Roseberry 1969:417, Layne 1958, Schwartz and Schwartz 1959:106). The swamp rabbit occurs in swampy woodlands and along banks of streams and drainage ditches.

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APPENDIX A

Threatened Vertebrates of the States Adjoining the Study Area

All vertebrates under threatened status in the states adjoining the study area are listed regardless of their occurrence in the study area itself. Nominating agencies are referenced by footnote in each section. Abbreviations identifying status are as follows: Status Undetermined (SU), Changing Status (CS), Rare (R), Threatened (T), Endangered (EN), Possibly Extirpated (PX), Extirpated (EX), and Extinct (X). The terms above are defined as previously.

FISHES

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Southern Brook Lamprey	Ichthyomyzon gagei Hubbs and Trautman					R	
American Brook Lamprey	Lampetra lamottei (Lesueur)					R	
Lake Sturgeon	Acipenser fulvescens Rafinesque	T	R	R&E	R	EN	
Pallid Sturgeon	Scaphirhynchus albus (Forbes and Richardson)	SU	R	R&E		EN	

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Shovelnose Sturgeon	Scaphirhynchus platorynchus (Rafinesque)				R		
Paddlefish	Polydon spathula (Walbaum)				R		
Alligator Gar	Lepisosteus spatula Lcaepede		R			R	
American Eel	Anguilla rostrata (Lesueur)						CS
Alabama Shad	Alosa alabamae Jordan and Evermann		R			R	
Skipjack Herring	Alosa chrysochloris (Rafinesque)						EX
Cisco or Lake Herring	Coregonus artedii Lesueur		R				CS
Lake Whitefish	Coregonus clupeaformis (Mitchill)		PX				
Bloater	Coregonus hoyi (Gill)						CS
Shortjaw Cisco	Coregonus zenithicus (Jordan and Evermann)						EN
Longjaw Cisco	Coregonus alpenae (Koelz)	EN					EN
Shortnose Cisco	Coregonus reighardi (Koelz)	SU					EN
Kiyi	Coregonus kiyi (Koelz)						CS
Deepwater Cisco	Coregonus johannae (Wagner)	T					EX

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Blackfin Cisco	Coregonus nigripinnis (Gill)	T					EX
Round Whitefish	Prosopium cylindraceum (Pallos)		R				
Ozark Minnow	Dionda nubila (Forbes)						EN
Brassy Minnow	Hybognathus hankinsoni Hubbs					R	
Cypress Minnow	Hybognathus hayi Jordan		PX			PX	
Northern Bigeye Chub	Hybopsis amblops (Rafinesque)		EN				
Sturgeon Chub	Hybopsis gelida (Girard)		R			EN	
Sicklefin Chub	Hybopsis meeki Jordan and Evermann		R			EN	
Gravel Chub	Hybopsis x-punctata Hubbs and Crowe						CS
Pallid Shiner	Notropis amnis Hubbs and Greene		R			PX	CS
Pugnose Shiner	Notropis anogenus Forbes		R				EN
Bigeye Shiner	Notropsis boops Gilbert		R				
Ghost Shiner	Notropis buchanani Meek						EX

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Striped Shiner	Notropis chrysocephalus (Rafinesque)						CS
Blackchin Shiner	Notropis heterodon (Cope)		R				
Blacknose Shiner	Notropis heterolepus Eigenmann and Eigenmann		R	R		EN	
Taillight Shiner	Notropis maculatus (Hay)					PX	
Sabine Shiner	Notropis sabinae Jordan and Gilbert					R	
Weed Shiner	Notropis texanus (Girard)						CS
Redfin Shiner	Notropis umbratilis (Girard)						CS
Longnose Dace	Rhinichthys cataractae (Valenciennes)			R			
Pugnose Minnow	Opsopoeodus emiliae Hay					EN	
Eastern Slim Minnow	Pimephales tenellus parviceps Hubbs and Black					EN	
Blue Sucker	Cycleptus elongatus (Lesueur)					R	
Creek Chubsucker	Erimyzon oblongus (Mitchill)						EX
River Redhorse	Moxostoma carinatum (Cope)		R				

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Black Redhorse	Moxostoma duquesnei (Lesueur)						EX
Greater Redhorse	Moxostoma valenciennesi Jordan						EN
Blue Catfish	Ictalurus furcatus (Lesueur)						EX
Brown Bullhead	Ictalurus nebulosus (Lesueur)					R	
Slender Madtom	Noturus exilis Nelson						CS
Neosho Madtom	Noturus placidis Taylor					EN	
Northern Madtom	Noturus stigmosus Taylor		R				
Ozark Cavefish	Ambylopsis rosae (Eigenmann)	T				R	
Spring Cavefish	Chologaster agassizi Putnam		R				
Burbot	Lota lota (Linnaeus)					R	
Golden Topminnow	Fundulus chrysotus (Gunther)					PX	
Banded Killifish	Fundulus diaphanus (Lesueur)		R				
Plains Killifish	Fundulus kansae Garman					R	
Mississippi Silverside	Menidia audens Hay					R	

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Banded Pygmy Sunfish	Elassoma zonatum Jordan		R				
Pumpkinseed	Lepomis gibbosus (Linnaeus)					EN	
Longear Sunfish	Lepomis megalotus (Rafinesque)						CS
Bantam Sunfish	Lepomis symmetricus Forbes		I.			R	
Crystal Darter	Ammocrypta asprella (Jordan)		E				
Western Sand Darter	Ammocrypta clara Jordan and Meek			R			
Bluebreast Darter	Etheostoma camurum (Cope)		I.				
Arkansas Darter	Etheostoma cragini Gilbert					R	
Harlequin Darter	Etheostoma histrio Jordan and Gilbert		R			EN	
Least Darter	Etheostoma microperca Jordan and Gilbert						CS
Niangua Darter	Etheostoma nianguae Gilbert and Meek	T				R	
Goldstripe Darter	Etheostoma parvipinne Gilbert and Swain					EN	
Redfin Darter	Etheostoma whipplei (Girard)					PX	

FISHES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Ia.[3]	Mn.[3]	Mo.[4]	Wis.[5]
Bluestripe Darter	Percina cymatotaenia (Gilbert and Meek)					R	
Gilt Darter	Percina evides (Jordan and Copeland)						CS
Longnose Darter	Percina nasuta (Bailey)					EN	

[1] OESIA (1973)

[2] Lopinot and Smith (1973)

[3] Miller (1972)

[4] Holt et al. (1974)

[5] Hine et al. (1973)

AMPHIBIANS AND REPTILES

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Hellbender	Cryptobranchus alleganiensis (Daudin)		EN		
Mole Salamander	Ambystoma talpoideum (Holbrook)		R		
Blue-Spotted Salamander	Ambystoma laterale Hallowell		R		
Dusky Salamander	Desmognathus fuscus conanti Rossman		EN		
Dark-Sided Salamander	Eurycea longicauda melanopleura (Cope)		R		
Oklahoma Salamander	Eurycea tynerensis Moore and Hughes			R	
Four-Toed Salamander	Hemidactylium scutatum (Schlegel)		R	R	
Dwarf Salamander	Manculus quadridigitatus (Holbrook)			EN	
Eastern Spadefoot	Scaphiopus holbrooki (Harlan)		R		
Eastern Narrow-Mouthed Toad	Gastrophryne carolinensis (Holbrook)		R		
Illinois Chorus Frog	Pseudacris streckeri illinoensis Smith	SU	R		
Western Bird-Voiced Treefrog	Hyla avivoca avivoca Viosca		R		
Green Treefrog	Hyla cinerea (Schneider)		R		

AMPHIBIANS AND REPTILES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Bullfrog	Rana catesbeiana Shaw				CS
Wood Frog	Rana sylvatica sylvatica Le Conte		R	EN	
Alligator Snapping Turtle	Macroclemys temmincki (Troost)		EN	R	
Illinois Mud Turtle	Kinosternon flavescens spooneri Smith		R		
Mud Turtle	Kinosternon subrubrum subrubrum (Lacepede)		R		
Spotted Turtle	Clemmys guttata (Schneider)		PX		
Blanding's Turtle	Emydoidea blandingii (Holbrook)			PX	
Ornate Box Turtle	Terrapene ornata (Agassiz)				EN
Hieroglyphic Turtle	Pseudemys concinna hieroglyphica (Holbrook) X floridana hoyi (Aggassiz)		R		
Western Slender Glass Lizard	Ophisaurus attenuatus attenuatus Cope		R		
Six-Lined Race Runner	Cnemidophorus sexlineatus (Linnaeus)				CS
Green Water Snake	Natrix cyclopion cyclopion (Dumeril, Birron and Dumeril)		R	R	
Queen Snake	Natrix septemvittata (Say)			EX	EN

AMPHIBIANS AND REPTILES (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Butler's Garter Snake	Thamnophis butleri Cope				EN
Northern Lined Snake	Tropidoclonion lineatum lineatum (Hallowell)		EN		
Western Hognose Snake	Heterodon nasicus Baird and Girard		R	EN	
Western Worm Snake	Carphophis amoenus vermis (Kennicott)		R	R	
Eastern Coachwhip	Masticophis flagellum flagellum (Shaw)		EN		
Smooth Green Snake	Opheodrys vernalis (Harlan)			R	
Great Plains Rat Snake	Elaphe guttata emoryi (Baird and Girard)		R		
Scarlet Snake	Cemophora coccinea (Blumenbach)		PX	R	
Northern Flat-Headed Snake	Tantilla gracilis hallowelli Cope		R		
Massasauga	Sistrurus catenatus (Rafinesque)			R	
Timber Rattlesnake	Crotalus horridus horridus Linnaeus		EN		
Canebrake Rattlesnake	Crotalus horridus atricaudatus Latreille			R	

[1]OESIA (1973)
[2]INPC (1971)
[3]Holt et al. (1974)
[4]Hine et al. (1973)

BIRDS

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Double-Crested Cormorant	Phalacrocorax auritus (Lesson)		EN	EN	EN
Water Turkey (Anhinga)	Anhinga anhinga (Linnaeus)			EX	
Little Blue Heron	Florida caerulea (Linnaeus)		R		
Snowy Egret	Leucophoyx thula (Molina)		R		
Black-Crowned Night Heron	Nycticorax nycticorax (Linnaeus)		R		
American Bittern	Botaurus lentiginosus (Rackett)		R		
Black Duck	Anas rubripes Brewster		R		
Pintail	Anas acuta Linnaeus		R		
Northern Shoveler	Anas clypeata Linnaeus		R		
Canvasback	Aythya valisineria (Wilson)		R		
Ruddy Duck	Oxyura jamaicensis (Gmelin)		R		
Hooded Merganser	Lophodytes cucullatus (Linnaeus)		R		
Black Vulture	Coragyps atratus (Bechstein)			R	
Swallow-Tailed Kite	Elanoides forficatus (Linnaeus)			EX	

BIRDS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Mississippi Kite	Ictinia misisippiensis (Wilson)			R	
Sharp-Shinned Hawk	Accipiter striatus Vieillot		R	EN	
Cooper's Hawk	Accipiter cooperii (Bonaparte)		EN	EN	CS
Red-Shouldered Hawk	Buteo lineatus (Gmelin)		EN	R	CS
Swainson's Hawk	Buteo swainsoni Bonaparte		PX		
Southern Bald Eagle	Haliaeetus leucocephalus leucocephalus (Linnaeus)	EN	EN	EX	EN
Northern Bald Eagle	Haliaeetus leucocephalus alascensis Townsend		EN	R	EN
Marsh Hawk	Circus cyaneus (Linnaeus)		R		CS
Osprey	Pandion haliaetus carolinensis (Gmelin)	SU	EN	EN	EN
Peregrine Falcon	Falco peregrinus anatum (Bonaparte)	EN	EN	EN	EX
Ruffed Grouse	Bonasa umbellus (Linnaeus)			R	
Greater Prairie Chicken	Tympanuchus cupido pinnatus (Brewster)	T	EN	EN	CS
Sharp-Tailed Grouse	Pediocetes phasinellus campestris Ridgeway				CS

BIRDS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Bobwhite	Colinus virginianus (Linnaeus)				CS
Wild Turkey	Meleagris gallapavo (Linnaeus)				CS
King Rail	Rallus elegans Audubon			R	
Yellow Rail	Coturnicops noveboracensis (Gmelin)		PX		CS
Black Rail	Laterallus jamaicens (Gmelin)		PX	SU	
Piping Plover	Charadrius melodus Ord				CS
Common Snipe	Capella gallinaego (Linnaeus)		R		
Upland Sandpiper	Bartramia longicauda (Bechstein)		EN	EN	CS
Wilson's Phalarope	Steganopus tricolor Vieillot		PX		
Forster's Tern	Sterna forsteri Nuttall		R		
Common Tern	Sterna hirundo Linnaeus		R		
Least Tern	Sterna albifrons Pallas		R	R	
Passenger Pigeon	Ectopistes migratorius (Linnaeus)	EX			EX
Barn Owl	Tyto alba (Scopoli)		R	E	CS
Long-Eared Owl	Asio otus (Linnaeus)		R		

BIRDS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Short-Eared Owl	Asio flammeus (Pontoppidan)		R		
Saw-Whet Owl	Aegolius acadicus (Gmelin)		R		
Yellow-Bellied Sapsucker	Sphyrapicus varius (Linnaeus)		R		
Red-Cockaded Woodpecker	Dendrocopos borealis (Vicillot)	EN		EX	
Western Kingbird	Tyrannus verticalis Say		R	R	
Fish Crow	Corvus ossifragus Wilson			R	
Red-Breasted Nuthatch	Sitta canadensis Linnaeus		R		
Brown-Headed Nuthatch	Sitta pusilla Latham			Ex	
Brown Creeper	Certhia familiaris Linnaeus		R		
Bewick's Wren	Thryomanes bewickii (Audubon)		R		CS
Veery	Hylocichla fuscescens (Stephens)		R		
Loggerhead Shrike	Lanius ludovicianus Linnaeus		R		CS
Solitary Vireo	Vireo solitarius (Wilson)		R		
Swainson's Warbler	Limnothlypis swainsonii (Audubon)		R	R	

BIRDS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Bachman's Warbler	Vermivora bachmanii (Audubon)	EN		EX	
Nashville Warbler	Vermivora ruficapilla (Wilson)		R		
Pine Warbler	Dendroica pinus (Wilson)		R		
Yellow-Headed Blackbird	Xanthocephalus xanthocephalus (Bonaparte)			R	
Brewer's Blackbird	Euphagus cyanocephalus (Wagler)		R		
Painted Bunting	Passerina ciris (Linnaeus)			R	
Lark Bunting	Calamospiza melanocorys Stejneger			R	
Le Conte's Sparrow	Passerherbulus caudacutus (Latham)		PX		
Henslow's Sparrow	Passerherbulus henslowii (Audubon)			R	
Bachman's Sparrow	Aimophila aestivalis (Lichtenstein)		EN	EN	
Clay-Colored Sparrow	Spizella pallida (Swainson)		PX		

[1]OESIA (1973)

[2]INPC (1971)

[3]Holt et al. (1974)

[4]Hine et al. (1973)

MAMMALS

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Southeastern Shrew	Sorex longirostris Bachman		R	R	
Pigmy Shrew	Microsorex hoyi (Baird)		R		
Southeastern Bat	Myotis austroriparius (Rhoads)		R		
Gray Bat	Myotis grisescens Howell		R	EN	
Keen's Bat	Myotis keenii (Merriam)			R	
Indiana Bat	Myotis sodalis Miller and Allen	EN	EN	EN	
Small Footed Myotis	Myotis leibii (Audubon and Bachman)			EN	
Western Big-Eared Bat	Plecotus townsendii Cooper	T			
Eastern Big-Eared Bat	Plecotus rafinesquii (Le Conte)		R	EN	
Black Bear	Euarctos ursus americanus Pallas			EN	
Marten	Martes americana (Turton)	SU			EN
Fisher	Martes pennanti (Erxleben)	SU			CS
Least Weasel	Mustela nivalis Linnaeus			R	
Long-Tailed Weasel	Mustela frenata Lichtenstein			R	

MAMMALS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
River Otter	Lutra canadensis (Schreber)		R	EN	
Wolverine	Gulo luscus (Linnaeus)	SU			EX
Eastern Timber Wolf	Canis lupus lycaon (Schreber)	EN			EX
Red Wolf	Canis rufus (Audubon and Bachman)	EN		PX	
Mountain Lion	Felis concolor cougar (Kerr)	T		EN	EX
Canada Lynx	Lynx canadensis Kerr	SU			EN
Bobcat	Lynx rufus (Schreber)		EN		CS
Red Squirrel	Tamiasciurus hudsonicus (Erxleben)		PX		
White Squirrel	Sciurus carolinensis (albinistic) Gmelin		R		
Plains Pocket Gopher	Geomys bursarius (Shaw)		R		
Plains Pocket Mouse	Perognathus flavescens (Merriam)			R	
Plains Harvest Mouse	Reithrodontomys montanus (Baird)			R	
Cotton Mouse	Peromyscus gossypinus LeConte		EN		
Golden Mouse	Ochrotomys nuttalli aureolus (Audubon and Bachman)		R		

MAMMALS (Continued)

Common Name	Scientific Name	U.S.[1]	Ill.[2]	Mo.[3]	Wis.[4]
Rice Rat	Oryzomys palustris (Harlan)		R		
Eastern Woodrat	Neotoma floridana illinoensis Howell		EN		
White-Tailed Jackrabbit	Lepus townsendii Bachman		EN	EN	CS
Black-Tailed Jackrabbit	Lepus californicus Gray			R	
Swamp Rabbit	Sylvilagus aquaticus (Bachman)			R	
Eastern Elk	Cervis canadensis canadensis Erxleben	EX			EX
Moose	Alces alces Gray				CS
Woodland Caribou	Rangifer caribou (Gmelin)				EX
Buffalo	Bison bison (Linnaeus)				EX

[1]OESIA (1973)

[2]INPC (1971)

[3]Holt et al. (1974)

[4]Hine et al. (1973)

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